2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: E-Business Technology
Career Cluster: Information Technology

	AS	AAS
CIP Number	1506.120100	0506.120100
Program Type	College Credit	College Credit
Standard Length	63 credit hours	63 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1099.12	15-1099.12
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in e-business such as computer specialists, database technicians, security specialists, Web content specialists, developers, technical, systems, and network analysts, Web security specialists, and Internet technical support specialists in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

This program focuses on a balance of business and technology components and allows the student to gain additional skills in one of four areas of specialization: Business, Technology, Software, and Security.

Program Structure

This program is a planned sequence of instruction consisting of 63 hours.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these

occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Program Length

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. The standard length of this program is 63 credit hours according to Rule 6A-14.030, F.A.C.

Certificate Programs

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).This AS/AAS degree program includes the following College Credit Certificates:

E-Business Technical Certificate (0506.120101) – 24 credit hours
E-Business Security Technical Certificate (0506.120102) – 24 credit hours
E-Business Software Technical Certificate (0506.120103) – 21 credit hours
E-Business Technology Technical Certificate (0506.120104) – 21 credit hours
E-Business Ventures Technical Certificate (0506.120105) – 24 credit hours

Standards for the above certificate programs are contained in separate curriculum frameworks.

Standards

After successfully completing this program, the student will be able to perform the following:

General Skills Core

01.0 Demonstrate comprehension and communication skills
02.0 Demonstrate professional development skills
03.0 Perform documentation and technical reference activities
04.0 Demonstrate employment skills
05.0 Perform general organizational workplace competencies
06.0 Demonstrate knowledge of legal and ethical issues
07.0 Perform project management activities

Technology Core

08.0 Understand issues related to E-Business.
09.0 Demonstrate proficiency in the use of web browsers and access to Internet resources
10.0 Understand local area networks
11.0 Demonstrate proficiency in microcomputer operating systems and software.
12.0 Perform Web authoring activities.
13.0 Conduct systems analysis and design.
14.0 Understand database management systems.

Business Core

15.0 Compare and contrast E-Business with traditional business
16.0 Identify, classify and demonstrate management activities for E-Business.
17.0 Identify legal and ethical issues for E-business
18.0 Accounting and finance activities
19.0 Perform marketing activities for E-business

In addition to the above core outcomes, the student will successfully complete the outcomes in at least one of the following specializations:

Security Specialization

20.0 Design, develop and implement physical, network, host, application, and user security systems for E-business.
21.0 Maintain and monitor security policies.

Software Specialization

20.0 Use various software applications, languages, and protocols for E-business environment.
21.0 Develop software applications for e-Business environment
22.0 Maintain systems quality and perform testing activities.

Technology Specialization

20.0 Perform Web Server Management activities

21.0 Support E-business applications and product development
22.0 Maintain network infrastructure
23.0 Design, integrate and deploy E-business systems
24.0 Perform technical requirements to support UNIX operating system
25.0 Maintain systems quality and perform testing activities.

Business Specialization

20.0 Perform management activities to support human resources in E-business environment
21.0 Perform activities to enhance supply chain management in E-business.
22.0 Use various models and strategies for E-business.
23.0 Perform customer service techniques for E-business.
24.0 Perform selling techniques for E-business.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **E-Business Technology**
CIP Numbers: **1506.120100 AS, 0506.120100 AAS**
Program Length: **63 credit hours**
SOC Code(s): **15-1099.12**

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. At the completion of this program, the student will be able to:

General Skills Core

01.0 Demonstrate comprehension and communication skills-The student will be able to:

- 01.01 Read and discuss work from different professional journals related to the course content.
- 01.02 Reflect on what has been learned through reading, recognizing assumptions and implications, and formulate ideas, opinions, and personal responses.
- 01.03 Use reference sources such as books, magazines, and electronic databases to gather and critically evaluate materials.
- 01.04 Write reports, summaries, and descriptive essays.
- 01.05 Write clear and well-organized research papers, integrating a variety of information.
- 01.06 Submit final drafts using correct grammar, punctuation, and spelling.
- 01.07 Prepare, outline and deliver an oral report with appropriate materials to the class
- 01.08 Participate in group discussions as a member and as a leader.
- 01.09 Take notes, organize, summarize, and paraphrase ideas and details.
- 01.10 Read both technical and non technical text accurately.
- 01.11 Follow written and oral technical instructions.
- 01.12 Read and understand graphs, charts, diagrams and tables commonly used in this industry/occupation.
- 01.13 Read trade journals and magazines to stay current in the industry

02.0 Demonstrate professional development skills-The student will be able to:

- 02.01 Identify corporate strategies and policies.
- 02.02 Maintain professional contact for future projects.
- 02.03 Build mentor relationships.
- 02.04 Anticipate future industry trends.
- 02.05 Continue education.
- 02.06 Review and analyze other industry productions.
- 02.07 Use and experiment with the technology.
- 02.08 Network with local professionals in the industry.
- 02.09 Read industry trade journals and magazines to stay current in the industry.
- 02.10 Attend seminars, workshops, and tradeshows.

03.0 Perform documentation and technical reference activities--The student will be able to:

03.01 Use technical vocabulary appropriately.
03.02 Locate information in technical references.
03.03 Prepare technical reports.
03.04 Describe appropriate documentation procedures and practices.
03.05 Produce and maintain system documentation, such as inventory, costs, installed software, and procedures.
03.06 Perform documentation and technical reference activities.
03.07 Cite correctly Internet-based resources using proper format.
03.08 Research industry trends on the Internet.

04.0 Demonstrate employment skills--The student will be able to:

04.01 Identify appropriate attire and grooming for a business office.
04.02 Conduct a job search.
04.03 Demonstrate job interview skills.
04.04 Identify methods for securing an employment references.
04.05 Identify and discuss issues contained within professional codes of conduct.
04.06 Use appropriate communication skills, courtesy, manners, and dress in the Workplace.
04.07 Identify acceptable work habits.
04.08 Identify and use acceptable strategies for resolving conflict in the workplace.
04.09 Identify and demonstrate appropriate responses to criticism from employers, supervisor, or other employees.
04.10 Apply principles and techniques for working productively with people of diverse cultures and backgrounds.
04.11 Identify techniques for stress management and prevention of job burn-out.
04.12 Use appropriate communication skills, telephone etiquette, courtesy, and manners when dealing with customers.
04.13 Demonstrate knowledge of how to make appropriate job changes.

05.0 Perform general organizational workplace competencies--The student will be able to:

05.01 Follow oral and written instructions.
05.02 Prepare, outline, and deliver a short oral presentation.
05.03 Participate in group discussion as a member and as a leader.
05.04 Obtain appropriate information from graphics, maps, or signs.
05.05 Prepare visual material to support an oral presentation.
05.06 Demonstrate self-motivation and responsibility to complete an assigned task.
05.07 List the steps in problem solving.
05.08 Choose appropriate action in situations requiring effective time management.
05.09 Apply principles and techniques for being a productive, contributing member of a team.
05.10 Communicate effectively with individuals lacking a technical background.
05.11 Identify clear detailed technical oral instructions.
05.12 Identify examples of effective strategies to fulfill end user needs training strategies and techniques.
05.13 Encourage and build mutual trust, respect, and cooperation among team members.
05.14 Apply techniques for organizing and planning of time and resources to complete an assigned task.

05.15 Assimilate new knowledge into project solutions and decisions.
05.16 Apply active listening techniques in interpersonal communications.
05.17 Identify strategies to improve and maximize productivity in the workplace.
05.18 Employ brainstorming techniques such as brainstorming to generate ideas and suggestions to achieve a task.
05.19 Analyze several alternatives and compare costs and benefits in determining the best solution.
05.20 Demonstrate the ability to use common office applications including word processing, spreadsheets, email, and presentation software.

06.0 Demonstrate knowledge of legal and ethical issues-The student will be able to:

06.01 Correctly cite or attribute sources.
06.02 Use copyrighted materials appropriately.
06.03 Discuss the types of works that are protected by intellectual property laws including copyrights, patents, trademarks and trade secrets.
06.04 Discuss the basic elements of a contract.
06.05 Discuss e-mail litigation, including anti-spam laws.
06.06 Discuss e-mail use and ownership.
06.07 Describe customer and employee privacy issues and safeguards.
06.08 Develop examples of acceptable use policies.
06.09 Compare organizational codes of ethics.
06.10 Research industry standards and codes of conduct for professionals.
06.11 Write a personal code of ethics.
06.12 Correctly cite or attribute sources.
06.13 Use copyrighted materials appropriately.

07.0 Perform project management activities-The student will be able to:

07.01 Describe the role of project management (PM) within the organization.
07.02 Identify the strengths and weaknesses of various project life cycle design.
07.03 Understand the importance of project scope management.
07.04 Compare and contrast project selection methods.
07.05 Build a Work Breakdown Structure (WBS), Gantt chart, and Pert Chart and describe those different elements.
07.06 Compare and contrast types of cost estimates.
07.07 Examine cost control and earned value analysis.
07.08 Examine organizational planning, staff acquisition, and team development.
07.09 Examine risk identification, quantification, response development, and response control.
07.10 Compare and contrast project tracking and project reporting.
07.11 Understand change control and configuration control.
07.12 Understand subcontracting and outsourcing.
07.13 Discuss and analyze project management case study.

Technology Core

08.0 Understand issues related to e-business-- The student will be able to:

08.01 Explain the difference between intranet and internet and the role of each in e-Business.

08.02 Explain the history, purpose and use of the World Wide Web and how it has enabled e-Business
08.03 Describe the rise of various e-Business models such as information and content models, broadcast/content aggregations models, interactive models, and content provider models.
08.04 Explain security issues related to electronic payment.
08.05 Explain issues of advertising, marketing and solicitation activities affecting e-business.

09.0 Demonstrate proficiency in the use of web browsers and access to internet resources--The student will be able to:

09.01 Explain the history, purpose and use of the World Wide Web
09.02 Describe proper Internet etiquette and usage.
09.03 Explain how to connect to the Internet
09.04 Explain the purpose and use of browsers and search engines
09.05 Understand and use Web browser tools to navigate the Web.
09.06 Demonstrate proficiency in email technologies by using email, setting up email accounts, and explaining communication and privacy issues specific to email.
09.07 Send electronic messages
09.08 Explain communication issues specific to email
09.09 Set up an e-mail account.
09.10 Participate in an email a web-based discussion group.
09.11 Explain and use proper Usenet electronic bulletin board etiquette.
09.12 Explain the guidelines for evaluating information needs before beginning a search an electronic search
09.13 Explain issues associated with pornography, free speech, censorship, filtering, and copyright on the Web.
09.14 Describe how to critically evaluate online information content.
09.15 Use bookmarks to create a bibliography
09.16 Capture images, text, sound, and data from Web pages
09.17 Work with File Transfer Protocol (FTP) clients
09.18 Identify and use instant messaging software
09.19 Design and publish a simple Web page using HTML and other Web page design software tools.

10.0 Understand local area networks--The student will be able to:

10.01 Identify and explain the main purpose of various communication hardware devices, communication media, and protocols.
10.02 Describe various network topologies.
10.03 Differentiate between the OSI reference model and the TCP/IP protocol architecture.
10.04 Explain components and functions of all layers in the OSI reference model.
10.05 Explain TCP/IP architecture.
10.06 Differentiate between analog and digital signals.
10.07 Describe various transmission media and how devices such as modems work.
10.08 Explain collision occurrences and detection.
10.09 Describe the function of a bridge and explain how bridges work.
10.10 Explain the factors and techniques for data transportation.

10.11 Understand issues in balancing network load, and calculating equipment necessary to handle expected load.

11.0 Demonstrate proficiency in microcomputer operating systems and software--The student will be able to:

11.01 Describe the historical development of computer operating software.
11.02 Describe the major hardware and related software of microcomputers.
11.03 Describe the various operating systems, including : Windows, Unix, Novell, etc.
11.04 Explain system and application architectures.
11.05 Describe various disk formats.
11.06 Use various software applications, including word processors, spreadsheets, databases, presentation software, and appointment scheduling applications.
11.07 Identify the major programming languages used in business data processing.
11.08 Locate requested information on a computer output, and recognize incorrect information.

12.0 Perform web authoring activities to support e-business -- The student will be able to:

12.01 Identify and describe the components of an HTML document.
12.02 Create lists in an HTML document.
12.03 Recognize the various layouts used in Web site design.
12.04 Use storyboarding to design a comprehensive Web site.
12.05 Create links between HTML documents within a Web site and to external HTML documents.
12.06 Link to another computer, to a downloadable file, to a mail program, or to a newsgroup.
12.07 Create tables.
12.08 Add images to Web pages.
12.09 Customize Web page color schemes.
12.10 Create image maps.
12.11 Identify and use Common Gateway Interface scripts.
12.12 Identify elements of HTML fill-in forms.
12.13 Use Server Side Includes (SSI) commands in an HTML document.
12.14 Identify the required components of a Web page that incorporate advanced features.
12.15 Incorporate Server Side Include commands in a functional Web site.
12.16 Describe the various CGI scripting languages used in a Web site.
12.17 Develop Web pages that utilize PERL scripts with CGI.
12.18 Modify and use JavaScript in a Web site.
12.19 Incorporate Java applets in a Web site.

13.0 Conduct systems analysis and design --The student will be able to:

13.01 Perform a preliminary investigation of a systems project.
13.02 Perform a detailed systems investigation and analysis of the project.
13.03 Design the input and output for the system.
13.04 Design the data files for the systems.
13.05 Design the processing flow of the system.
13.06 Design a system to insure that only valid data is accepted and processed, completely and accurately.

13.07 Establish a project plan for the development and implementation of the systems.
13.08 Program and test the system.
13.09 Develop the final systems documentation.
13.10 Conduct necessary training and file conversion to properly implement the system.
13.11 Understand industry-standard models for developing and maintaining software such as the Capability Maturity Model.
13.12 Be able to use industry-standard tools such as Unified Modeling Language (UML) to model a systems development project.

14.0 Understand database management systems --The student will be able to:

14.01 Understand the role of databases and how databases influence E-business decisions.
14.02 List the advantages and disadvantages of using databases.
14.03 Understand the importance of data modeling as an analysis and communication tool.
14.04 Describe the elements of a data model.
14.05 Model the data requirements for sample E-business problems.
14.06 Understand the principles associated with the relational model.
14.07 Understand the relationship between functional dependencies and keys.
14.08 Determine the Normal form of a relation and execute the steps necessary to put the relation into the proper normal form.
14.09 Define and contrast logical and physical keys.
14.10 Understand the advantages and disadvantages of indexes.
14.11 Understand the basic operators of relational algebra as a basis for retrieving data from relational databases.
14.12 Create and use Structured Query Language (SQL) to retrieve data from a database.

Business Core

15.0 Compare and contrast e-business with traditional business models- The student will be able to:

15.01 Describe the evolution of e-business, how it changed the marketplace, and the benefits to society.
15.02 Define e-business and its categories.
15.03 Describe how business operations have changed due to e-business.
15.04 Explain the basic business models of electronic marketing.
15.05 Identify critical success factors for electronic marketing.
15.06 Explain the impact of the Internet on customers and markets for businesses.
15.07 Describe consumer buying behavior and organizational buying behavior.
15.08 Explain how service industries conduct business electronically.
15.09 Describe several innovative applications in the service sector.
15.10 Explain how business-to-business commerce is conducted.
15.11 Describe the application and key technologies for business- to-business e-commerce models.
15.12 Describe the relationship between the Internet, intranet and extranet.
15.13 Describe the typical electronic payment system.
15.14 Identify the various payment options in e-commerce.

15.15 Explain the strategic planning issues for e-business
15.16 Identify the critical success factors of an e-business project/venture.
15.17 Discuss contractual issues and copyright infringement on the Web.
15.18 Explain the global economics and its impact e-business.
15.19 Describe the major components and impact of Web-based economics

16.0 Identify, classify and demonstrate management activities for e-business—The student will be able to:

16.01 Define the role of the entrepreneur in business-in the United States and across the World.
16.02 Describe the entrepreneurial profile.
16.03 Discuss the role of the internet in helping small business expand their market opportunities both in the United States and abroad.
16.04 Explain the importance of strategic management to business.
16.05 Describe the components of a marketing plan and explain the benefits of preparing one.
16.06 Describe how to prepare financial statements & use them to manage the business.
16.07 Describe effective pricing strategies.
16.08 Discuss the links among pricing, image, and competition.
16.09 Explain what seed capital is and why it is so important to the entrepreneurial process.
16.10 Explain the difference in the three types of capital that small businesses require: Fixed, Working and Growth.
16.11 Explain the stages in the location decision.
16.12 Describe the location criteria and outline the basic location options for retail and service business.
16.13 Explain purchasing, quality control, vender analysis and managing inventory while using technology to gain a competitive edge.
16.14 Explain the challenges involved in the entrepreneur's role as leader and what it takes to be a successful leader.
16.15 Learn management succession and risk management strategies in family business together with ethics and social responsibility.
16.16 Describe, explain and discuss business's responsibility to employees, customers, investors and the community.
16.17 Describe management's historical role in business operations.
16.18 Compare and contrast different management philosophies.
16.19 Compare and contrast the employees' personal needs with those of the organization.
16.20 Describe methods managers can use to deal with management politics.
16.21 Describe the nature of management's legal environment for traditional and electronic environments.
16.22 Describe the planning process of managers.
16.23 Discuss the characteristics and functions of an organization chart.
16.24 Describe the act and benefits of delegation.
16.25 Summarize the components of job descriptions and specifications.
16.26 Define and describe the activities involved in making a job analysis.
16.27 Discuss potential problems in evaluating employees and methods to avoid problems.

16.28 Discuss strategies managers may use to build and sustain high morale and motivation.
16.29 Describe methods of direct and indirect compensation.
16.30 Describe various employee relations practices.
16.31 Summarize strategies to improve personal and organizational communication.
16.32 Discuss the role of information systems in the control system.
16.33 Discuss the steps in the basic decision making process.
16.34 Describe several factors that influence decision-making.
16.35 Distinguish among management functions.
16.36 Demonstrate knowledge of the relationship between authority and responsibility to task accomplishment.
16.37 Select the most effective communication systems.
16.38 Identify problems and make an appropriate decision.

17.0 Identify legal and ethical issues for e-business -- The student will be able to:

17.01 Describe the procedure to obtaining protection under each intellectual property law.
17.02 Describe and recognize material that is defamatory.
17.03 Explain the right of publicity and the right of privacy.
17.04 Explain copyright assignment and the Visual Artists Rights Act.
17.05 Discuss licensing text, photos, films, television clips, characters, and games, Domain name registration, cybersquatting and anti-cybersquatting regulations.
17.06 Describe the importance in choosing a strong trademark.
17.07 Understand basic laws that apply to e-commerce.
17.08 Explain how Article Two of the UCC that applies to the sale of goods involved in E-business.
17.09 Discuss current US laws that regulate e-business, such as the Uniform Computer Information Transactions Act, clickwraps, sales tax, and advertising.
17.10 Explain the meaning of linking, framing and caching.
17.11 Discuss the permission required for linking, revenue-sharing agreements, and liability issues pertaining to linking.
17.12 Discuss e-mail litigation, including anti-spam laws.
17.13 Describe licensing music for use.
17.14 Discuss copyright issues important to ISPs.
17.15 Explain other liability issues for ISPs, such as, defamation, privacy, trademark and patent.
17.16 Discuss when to use trademark protection and trade secret protection for their property.

18.0 Accounting and finance activities. The student will be able to:

18.01 Identify and understand accounting and financial concepts.
18.02 Describe and use financial analysis tools.
18.03 Perform standard accounting and bookkeeping functions such as transaction recording, journaling, preparation of standard statements and balance sheets, and check preparation.
18.04 Understand the impact and implications of federal auditing guidelines, such as Sarbanes-Oxley.

19.0 Perform marketing activities for e-business The student will be able to:

19.01 Discuss what marketing is and why it is important to organizations and individuals.
19.02 Describe the key decisions in the development of corporate strategy.
19.03 Recognize the outcomes of consumers' decisions to purchase or not to purchase and how these affect marketing success.
19.04 Define and explain market segmentation, target markets, and product differentiation and positioning.
19.05 Describe the issues involved in product and brand positioning.
19.06 Differentiate between consumer and business products, and discuss the different types of each.
19.07 Describe the way marketing research is used in the new-product development process.
19.08 Identify many of the influences on marketers' pricing decisions.
19.09 Explain how consumers form perceptions of quality and value.
19.10 Explain the functions and key activities of marketing channels.
19.11 Distinguish between direct and indirect marketing channels.
19.12 Explain the key elements of the marketing communications process.
19.13 Describe the key activities in sales management.
19.14 Explain the difference between e-business, e-commerce, and e-marketing.

Security Specialization

20.0 Design, develop and implement physical, network, host, application and user security systems for e-business -- The student will be able to:

20.01 Explain use and purpose of security policies.
20.02 Conduct a security audit.
20.03 Control access to systems, resources and data.
20.04 Explain and manage system security in common Operating Systems.
20.05 Describe concepts of web servers and their role in the network.
20.06 Plan and implement a web server.
20.07 Identify the various hardware and software requirements for a web server.
20.08 Explain how documents and files are stored on a web server.
20.09 Describe different methods for projecting future traffic on a web server.
20.10 Identify the necessary steps to ensure reliability and response of the server.
20.11 Describe and implement the process for effectively organizing a web site.
20.12 Install, configure, and maintain a Web server.
20.13 Publish a web document so that it is easily located through various search engines on the Internet.
20.14 Set up the web server so that dynamic content can be provided to users of the web site.
20.15 Perform corrective, and preventative maintenance on a web server.
20.16 Analyze server log files to determine trends in web server utilization.
20.17 Discuss Internet services operation and the security risk imposed by them on the network.
20.18 Identify vulnerabilities in World Wide Web protocols and counter-measures for securing them.
20.19 Describe the operation of electronic mail and news services protocols and how to effectively secure them.

20.20 Describe the operation of file transfer and printing service protocols and how to effectively secure them.
20.21 Describe the operation of remote access services protocols and how to effectively secure them.
20.22 Describe the operation of real-time conferencing service protocols and how to effectively secure them.
20.23 Properly configure and describe the operation of naming and directory services.
20.24 Describe the operation of authentication and auditing services protocols and how to effectively secure them.
20.25 Describe the operation of administrative services protocols and how to effectively secure them.
20.26 Describe the operation of the IP Security protocol.
20.27 Implement effective measures to secure various service protocols.

21.0 Maintain and monitor security policies--The student will be able to:

21.01 Identify basic network security.
21.02 Describe purpose and use of packet sniffing, firewalls and proxies.
21.03 Define web server security.
21.04 Protect against the risks of directory browsing.
21.05 Assess client security issues (including ActiveX, JavaScript, Cookies, etc.)
21.06 Install and configure network security tools
21.07 Explain the strengths, and weaknesses of cryptography as a security tool
21.08 Describe authentication and identification schemes
21.09 Define secure software.
21.10 Describe the use and purpose of encryption.
21.11 Define the advantages of Secure Socket Layer (SSL).
21.12 Define certificate authority.
21.13 Identify basic aspects of intrusion detection and steps to protect the web server from these threats.
21.14 Explain the history of cryptographic methodology.
21.15 Describe cryptographic attack models.
21.16 Describe the secret key and public key encryption methodology.
21.17 Use hashing techniques.
21.18 Use digital signatures in a network environment.
21.19 Explain applied cryptography.
21.20 Use authentication processes in heterogeneous environments.
21.21 Create secure environment through defensive programming.
21.22 Explain the basic elements of Security Testing and Auditing.
21.23 Describe the capabilities of effective signature filter techniques.
21.24 Explain the importance of architectural design detection of intrusions.
21.25 Describe interoperability aspects of various commercial IDS solutions.
21.26 Define and utilize various network based Intrusion Detection Solutions (IDS).
21.27 Detect various exploitation attempts in a network environment.
21.28 Explain intrusion detection and denial of service.
21.29 Describe techniques for gathering intelligence on intrusion detection and the latest tools and techniques used by hackers.
21.30 Define and recognize structured attacks and differentiate from unstructured attacks.
21.31 Explain management issues related to intrusion detection.
21.32 Implement appropriate security measures following risk analysis.

21.33 Implement appropriate security measures to minimize risks from hackers.
21.34 Issue and manage digital certificates.

Software Specialization

20.0 Use various programming software applications, languages and protocols for e-business environment --The student will be able to:

20.01 Explain the key network protocols used with the World Wide Web including Transmission Control Protocol (TCP), Internet Protocol (IP), and Hypertext Transfer Protocol (HTTP)
20.02 Explain how applets differ from applications in terms of program form, operating context, and how they are started.
20.03 Describe and use single- and multi-dimensional arrays.
20.04 Create classes that use inheritance aspects of the object-oriented paradigm.
20.05 Explain the use of keywords such as: static, final, abstract, inner classes, interface, etc.
20.06 Describe the error handling constructs.
20.07 Write a program that reads and writes text files.
20.08 Understand the hierarchy of classes designed for aggregate data such as Collections, and use sets and lists.
20.09 Identify deprecated classes, and explain how to migrate.
20.10 Use the jar tool.
20.11 Explain and use event handling in a GUI.
20.12 Use network utilities to monitor network activity, determine IP addresses, and locate Web servers.
20.13 Differentiate between client-side scripting and server-side scripting.
20.14 Manipulate the objects contained in the Document Object Model (DOM).
20.15 Use variables and constants within a script.
20.16 Use variables, constants, and arithmetic operators to create valid arithmetic expressions.
20.17 Dynamically alter the sequence of script execution.
20.18 Use built-in functions as well as create custom functions, subroutines, and procedures within software using scripting languages.
20.19 Create server pages using languages such as Active Server Pages (ASP) or Java Server Pages (JSP).
20.20 Write programs in a language such as java that allows use of objects like Socket, SocketServer, URL and Connection.
20.21 Create and use server-side include files.
20.22 Use a standard object such as Request to process forms and access server variables
20.23 Use a standard object such as Response to control output from the server.
20.24 Create programs that communicate across the Internet using conventions such as Remote Method Invocation.
20.25 Create and use the Global Application File.
20.26 Understand appropriate use of and demonstrate ability to incorporate and utilize cookies in e-Business software.
20.27 Integrate standard object model components with server pages.
20.28 Create web page using data from a database.
20.29 Implement programs that use local or remote databases with standard protocols.
20.30 Create applications such as Servlets that send HTML pages to Internet clients.

20.31 Use a scripting language on the client side of a distributed program.
20.32 Create and use reusable objects such as Java Beans appropriately in distributed applications.
20.33 Implement levels of security in distributed software applications and applets.
20.34 Read simple UML diagrams, and create UML documents that model programs.
20.35 Use built-in objects for error handling, file creation, and dictionary access in e-Business software.
20.36 Explain protocols designed to allow programming designed to provide network services for applications on small homogenous networks, such as NetBIOS programming
20.37 Understand the use of client-side operating system tools such as Windows redirector.
20.38 Produce software that can interface with operating system services used to broadcast messages within a domain, such as mailslot networking technology.
20.39 Utilize appropriate operating system interfaces to redirect output of one application as input of another through the use of pipe networking technology.
20.40 Describe the protocol address families supported by Winsock and create a socket.
20.41 Create connection-oriented and connectionless Winsock protocols.
20.42 Describe various Winsock I/O models.
20.43 Differentiate between options used with sockets and other operating system techniques used to manipulate device parameters of special files, such as ioctl.
20.44 Describe various name space models.
20.45 Register and query a service.
20.46 Use transport service providers and name space service providers.
20.47 Explain the history of Extensible Markup Language (XML)
20.48 Use the Document Type Definitions that define an XML document structure.
20.49 Use schemas for validating an XML document.
20.50 Incorporate XML code into web documents, and manipulate the contents of an XML document.
20.51 Explain the use and purpose of Xpath and Simple API.
20.52 Write SXLT documents
20.53 Use XSL transformations
20.54 Explain Extensible Hypertext Markup Language (XHTML).
20.55 Explain emerging trends in XML-related technologies.
20.56 Explain and use the different elements that make code easier to read.
20.57 Explain and use the different data types available in scripting languages.
20.58 Explain and use standard control structures such as repetition, selection, and sequence in the appropriate programming language.
20.59 Output data from scripting languages such as PERL to various formats.
20.60 Explain the benefits of using subroutines and libraries in code.
20.61 Debug code from scripting languages such as PERL.
20.62 Explain basic Internet and server-side scripting security issues and common techniques to fix them.
20.63 Use a scripting language such as PERL to create and manage form data submitted over the Internet.
20.64 Examine the use of shopping carts on the Internet and how scripting languages such as PERL can be use in these applications.
20.65 Examine the use of auctions via the Internet and how scripting languages such as PERL can be used.
20.66 Understand industry standard program design techniques.

20.67 Develop the logic for a program using both flowcharting and pseudo code.
20.68 Develop looping and nested looping logic.
20.69 Document programs.
20.70 Develop the logic of: three-level control break program, an extract program, an edit program, a file matching and an update program.
20.71 Interpret a simple table.

21.0 Develop software applications for e-business environment --The student will be able to:

21.01 Explain the architecture of a Wireless Application Protocol (WAP) application
21.02 Identify a variety of WAP micro-browsers.
21.03 Configure Web servers to recognize appropriate MIME types.
21.04 Identify a variety of vendor supplied development toolkits and explain the strengths and weakness of each.
21.05 Explain the purpose of a WAP gateway.
21.06 Evaluate various WAP gateway products and describe the strengths and weaknesses of each.
21.07 Create Wireless Markup Language (WML) decks.
21.08 Create client-side scripts using WML Script.
21.09 Incorporate ease of use features into WAP applications.
21.10 Incorporate dynamic content in WAP applications by using ASP.
21.11 Design software applications that are accessible by a variety of wireless and wired devices.
21.12 Explain alternatives to using ASP to create dynamic content for WAP applications.
21.13 Create a strategy to convert existing HTML based web sites to WAP.
21.14 Build a simple email system accessible from wireless devices.
21.15 Explain security issues and options in a WAP application.
21.16 Integrate the push model of information delivery.
21.17 Explain the architecture of Wireless Telephony applications (WTA) and other wireless architectures.
21.18 Use various HTML elements.
21.19 Explain the various database concepts and vocabulary including: tables, columns, rows, data types, primary and foreign keys, relationships, queries, and relational database design techniques.
21.20 Use operating system services such as a personal web server for database development.
21.21 Explain server security and permissions.
21.22 Evaluate the advantages / disadvantages of different server platforms.
21.23 Explain scripting concepts and syntax.
21.24 Connect common databases using standard protocols.
21.25 Display data from a database using a Web interface.
21.26 Write and modify a database record using a Web interface.
21.27 Enable Web security features and tune Web applications.
21.28 Design and implement a basic shopping cart application.

Technology Specialization

20.0 Perform web server management activities -- The student will be able to:

20.01 Perform console management in the author and user mode.

20.02 Navigate and create a custom management console.
20.03 Create new user accounts.
20.04 Implement groups into a domain.
20.05 Change the domain mode.
20.06 Manage software settings, scripts, and security settings.
20.07 Manage administrative templates.
20.08 Manage folder redirection.
20.09 Configure and administer network printers.

21.0 Support e-business applications and product development -The student will be able to:

21.01 Identify the different components to systems development life cycle and how they are interrelated.
21.02 Identify deliverables for user project and build subprojects within lifecycle components.
21.03 Create physical structure of web-based architecture.
21.04 Create requirements for business request, develop web components necessary to satisfy request and test for acceptance.
21.05 Use web browser and web authoring tools.
21.06 Write required queries to get required answer sets.

22.0 Maintain network infrastructure --The student will be able to:

22.01 Analyze the infrastructure for E-business, the Internet, packet-switched networks, several Web markup languages, and popular Internet applications, protocols, and utility programs.
22.02 Identify Web server hardware and discus performance evaluation.
22.03 Describe security threat countermeasures, including anti-virus software and encryption.
22.04 Identify basic components of electronic payment systems.
22.05 Identify how to create and maintain an effective Web presence and brand.
22.06 Describe various Electronic Data Interchange components.
22.07 Define and explain virtual communities and Web portals.
22.08 Identify challenges of a global business regarding culture, legal and financial impacts, and differing languages.
22.09 Identify the planning stages of the E-Business Project.

23.0 Design, integrate and deploy e-business systems -- The student will be able to:

23.01 Describe the lifecycle of an E-Business.
23.02 Explain Web site information architecture design principles.
23.03 Identify various E-Business systems development strategies.
23.04 Explain integration with LDAP, Messaging, and Collaboration.
23.05 Identify and describe the use of Meta Directories, Content Syndication, Single Sign-on, and Search Engines.
23.06 Identify various deployment strategies and Middleware.
23.07 Identify various Application Server Systems Architectures.
23.08 Explain Transaction Processing (TP) monitor systems architecture.
23.09 Identify various integration solutions.

24.0 Perform technical requirements to support UNIX operating system -The student will be able to:

24.01 Explain the history of UNIX
24.02 Explain basic command syntax for approximately 100 common shell commands governing the file-system, printing and process control.
24.03 Identify various UNIX editors and use the vi editor.
24.04 Schedule and reprioritize processes running under UNIX.
24.05 Use commands to get information and communicate with remote users.
24.06 Search for strings of text in files using shell meta-characters.
24.07 Use Awk to generate reports or filter text.
24.08 Use Korn shell scripts to control flow, input, output and jobs.
24.09 Use C shell variables and arrays.
24.10 Troubleshoot various system problems.

25.0 Maintain systems quality and perform testing activities -- The student will be able to:

25.01 Identify the advantages and disadvantages of client-server computing.
25.02 Establish controls in a client-server framework.
25.03 Explain software testing methodology.
25.04 Describe the planning, executing and controlling of the testing process.
25.05 Perform Graphical User Interface testing.
25.06 Explain the server applications testing processes.
25.07 Explain testing in a networked application environment.
25.08 Incorporate cross-level functional testing within a data-driven framework-based environment.
25.09 Use client-server testing metrics.
25.10 Explain testing integration on the desktop.
25.11 Explain testing for web-based client-server applications.
25.12 Select and use appropriate automated test tools.

Business Specialization

20.0 Perform management activities to support human resources in an e-business environment --The student will be able to:

20.01 Describe the history of human resources.
20.02 Summarize the importance of human resources.
20.03 Identify career choice in human resources.
20.04 Describe the components of the job requirement and analysis process.
20.05 Describe the important elements of effective human resource planning.
20.06 Discuss the performance appraisal and the uses of the performance appraisal.
20.07 Compare various training options available to organizations.
20.08 Discuss strategies to improve organizational performance (various types of work teams, suggestion systems, goal setting, job redesign, etc.).
20.09 Describe various ways of compensating employees.
20.10 Summarize the legal regulations of compensation systems.
20.11 Explain the importance o maintaining employees.
20.12 Discuss the importance of safety and health laws and standards.
20.13 Describe how to create a safe and healthy work environment.
20.14 Describe labor relations and collective bargaining.

21.0 Perform activities to enhance supply chain management --The student will be able to:

21.01 Explain the electronic environment of the supply chain.
21.02 Explain the importance of information in an integrated supply chain.
21.03 Explain the technological applications for supply chain management.
21.04 Discuss how to engineer or reengineer the supply chain for optimal materials planning and handling.
21.05 Explain how relationships are important to the supply chain.
21.06 Explain the importance of suppliers in the supply chain.
21.07 Describe how to resolve conflicts in the supply chain.
21.08 Explain the laws and regulations regarding "order taking", such as the 30-Day rule, shipment representation, delay and cancellation notices, and refunds.
21.09 Describe the components involved in an international supply chain management system.

22.0 Use various models and strategies for e-business--the student will be able to:

22.01 Explain the components, linkages, and evaluation of Business Models and their relationship with e-business.
22.02 Describe the competitive environment and how it can affect an Internet business.
22.03 Describe competitive advantages and how the general manager of an Internet business can use this information.
22.04 The student will be able to describe the current strengths, weaknesses, opportunities, and threats to Internet business given general and specific information.
22.05 Describe the limitations to transactions over the Internet.
22.06 Describe the dynamics and appraisal of a business model.
22.07 Explain value configurations for the Internet.
22.08 Describe the process of valuing and financing an Internet start-up.
22.09 Describe macro environments and the impact on performance.
22.10 Explain the differences between incumbents and new entrants.

23.0 Perform customer service techniques for e-business-- The student will be able to:

23.01 Define customer service.
23.02 Explain the advantages and disadvantages of customer service.
23.03 Discuss solutions to overcoming obstacles in customer service.
23.04 Define service culture in organizations.
23.05 Describe management's role in customer service formulation.
23.06 Describe employee empowerment and its importance in providing good customer service.
23.07 Explain the role of communicating in customer service.
23.08 Explain the difference behavioral styles of a challenging customer.
23.09 Describe strategies of dealing with challenging customers.
23.10 Describe the basic behavioral styles of customers.
23.11 Determine strategies for working with various customer behaviors.

24.0 Perform selling techniques for e-business -- the student will be able to:

24.01 Describe the relationship of personal selling to market-driven economies.

24.02 List the four broad strategic areas that make up the consultative-style selling model and the characteristics of each.
24.03 Identify career opportunities in the field of selling.
24.04 Explain the importance of relationship skills in personal selling.
24.05 Explain the importance of projecting a positive self-image.
24.06 Discuss communication-style bias and how it influences the relationship process.
24.07 Identify reasons why salespeople and customers benefit from thorough product knowledge.
24.08 List major sources of product information.
24.09 Discuss the evolving role of strategic selling.
24.10 Discuss the factors that influence people to make buying decisions.
24.11 Explain how to plan a sales presentation.
24.12 List criterion for qualifying and organizing prospects.
24.13 List guidelines for effective demonstrations.
24.14 Outline general strategies for negotiating buyer resistance.
24.15 Describe the proper attitude to display toward closing the sale.
24.16 List guidelines for closing the sale.
24.17 Explain how customer service can stimulate repeat business and referrals.
24.18 Describe how to properly handle activities that are part of the customer service program.
24.19 Describe the functions of a sales manager.
24.20 Explain how to manage time wisely.
24.21 List factors that influence the ethical conduct of sales personnel.
24.22 List and describe the functions of telemarketing.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **E-Business Technical Certificate**
Career Cluster: **Information Technology**

CCC	
CIP Number	0506.120101
Program Type	College Credit Certificate (CCC)
Program Length	24 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1099.12
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the E-Business Technology AS/AAS degree program (0506.120100).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the

instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

07.0 Perform project management activities.
08.0 Understand issues related to E-Business.
15.0 Compare and contrast E-Business with traditional business.
16.0 Identify, classify and demonstrate management activities for E-Business.
17.0 Identify legal and ethical issues for E-business.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **E-Business Technical Certificate**
CIP Number: **0506.120101**
Program Length: **24 credit hours**
SOC Code(s): **15-1099.12**

This certificate program is part of the E-Business Technology AS/AAS degree program (0506.120100). At the completion of this program, the student will be able to:

07.0 Perform project management activities-The student will be able to:

- 07.01 Describe the role of project management (PM) within the organization.
- 07.02 Identify the strengths and weaknesses of various project life cycle designs.
- 07.03 Understand the importance of project scope management.
- 07.04 Compare and contrast project selection methods.
- 07.05 Build a Work Breakdown Structure (WBS), Gantt chart, and Pert Chart and describe those different elements.
- 07.06 Compare and contrast types of cost estimates.
- 07.07 Examine cost control and earned value analysis.
- 07.08 Examine organizational planning, staff acquisition, and team development.
- 07.09 Examine risk identification, quantification, response development, and response control.
- 07.10 Compare and contrast project tracking and project reporting.
- 07.11 Understand change control and configuration control.
- 07.12 Understand subcontracting and outsourcing.
- 07.13 Discuss and analyze project management case study.

08.0 Understand issue related to E-business-- The student will be able to:

- 08.01 Explain the difference between intranet and internet and the role of each in e-Business.
- 08.02 Explain the history, purpose and use of the World Wide Web and how it has enabled e-Business.
- 08.03 Describe the rise of various e-Business models such as information and content models, broadcast/content aggregations models, interactive models, and content provider models.
- 08.04 Explain security issues related to electronic payment.
- 08.05 Explain issues of advertising, marketing and solicitation activities affecting e-business.

15.0 Compare and contrast E-business with traditional business models--The student will be able to:

- 15.01 Describe the evolution e-business, how it has changed the market place, and the benefits to society.
- 15.02 Define e-business and its categories.
- 15.03 Describe how business operations have changed due to e-business.
- 15.04 Explain the basic business models of electronic marketing.

15.05 Identify critical success factors for electronic marketing.
15.06 Explain the impact of the Internet on customers and markets for businesses.
15.07 Describe consumer buying behavior and organizational buying behavior.
15.08 Explain how service industries conduct business electronically.
15.09 Describe several innovative applications in the service sector.
15.10 Explain how business-to-business commerce is conducted.
15.11 Describe the application and key technologies for business-to-business e-commerce models.
15.12 Describe the relationship between the Internet, intranet and extranet.
15.13 Describe the typical electronic payment system.
15.14 Identify the various payment options in e-commerce.
15.15 Explain the strategic planning issues for e-business.
15.16 Identify the critical success factors of an e-business project/venture.
15.17 Discuss contractual issues and copyright infringement on the Web.
15.18 Explain the global economics and its impact e-business.
15.19 Describe the major components and impact of Web-based economics

16.0 Identify and demonstrate management activities--The student will be able to:

16.01 Define the role of the entrepreneur in business-in the United States and across the World.
16.02 Describe the entrepreneurial profile.
16.03 Discuss the role of the internet in helping small business expand their market opportunities both in the United States and abroad.
16.04 Explain the importance of strategic management to a business.
16.05 Describe the components of a marketing plan and explain the benefits of preparing one.
16.06 Describe how to prepare financial statements & use them to manage the business.
16.07 Describe effective pricing strategies.
16.08 Discuss the links among pricing, image, and competition.
16.09 Explain what seed capital is and why it is so important to the entrepreneurial process.
16.10 Explain the difference in the three types of capital small businesses require: Fixed, Working and Growth.
16.11 Explain the stages in the location decision.
16.12 Describe the location criteria and outline the basic location options for retail and service business.
16.13 Explain purchasing, quality control, vender analysis and managing inventory while using technology to gain a competitive edge.
16.14 Explain the challenges involved in the entrepreneur's role as leader and what it takes to be a successful leader.
16.15 Learn management succession and risk management strategies in family business together with ethics and social responsibility.
16.16 Describe, explain and discuss business's responsibility to employees, customers, investors and the community.
16.17 Describe management's historical role in business operations.
16.18 Compare and contrast different management philosophies.
16.19 Compare and contrast the employees' personal needs with those of the organization.
16.20 Describe methods managers can use to deal with management politics.

16.21 Describe the nature of management's legal environment for traditional and electronic environments.
16.22 Describe the planning process of managers.
16.23 Discuss the characteristics and functions of an organization chart.
16.24 Describe the act and benefits of delegation.
16.25 Summarize the components of job descriptions and specifications.
16.26 Define and describe the activities involved in making a job analysis.
16.27 Discuss potential problems in evaluating employees and methods to avoid problems.
16.28 Discuss strategies managers may use to build and sustain high morale and motivation.
16.29 Describe methods of direct and indirect compensation.
16.30 Describe various employee relations practices.
16.31 Summarize strategies to improve personal and organizational communication.
16.32 Discuss the role of information systems in the control system.
16.33 Discuss the steps in the basic decision making process.
16.34 Describe several factors that influence decision-making.
16.35 Distinguish among management functions.
16.36 Demonstrate knowledge of the relationship between authority and responsibility to task accomplishment.
16.37 Select the most effective communication systems.
16.38 Identify problems and make an appropriate decision.

17.0 Identify legal and ethical issues for E-business-- The student will be able to:

17.01 Describe the procedure to obtaining protection under each intellectual property law.
17.02 Describe and recognize material that is defamatory.
17.03 Explain the right of publicity and the right of privacy.
17.04 Explain copyright assignment and the Visual Artists Rights Act.
17.05 Discuss licensing text, photos, films, television clips, characters, and games, Domain name registration, cybersquatting and anti-cybersquatting regulations.
17.06 Describe the importance in choosing a strong trademark.
17.07 Understand basic laws that apply to e-commerce.
17.08 Explain how Article Two of the UCC that applies to the sale of goods involved in E-business.
17.09 Discuss current US laws that regulate e-business, such as the Uniform Computer Information Transactions Act, clickwraps, sales tax, and advertising.
17.10 Explain the meaning of linking, framing and caching.
17.11 Discuss the permission required for linking, revenue-sharing agreements, and liability issues pertaining to linking.
17.12 Discuss e-mail litigation, including anti-spam laws.
17.13 Describe licensing music for use.
17.14 Discuss copyright issues important to ISPs.
17.15 Explain other liability issues for ISPs, such as, defamation, privacy, trademark and patent.
17.16 Discuss when to use trademark protection and trade secret protection for their property.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **E-Business Security Technical Certificate**
Career Cluster: **Information Technology**

CCC	
CIP Number	0506.120102
Program Type	College Credit Certificate (CCC)
Program Length	24 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1071
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the E-Business Technology AS/AAS degree program (0506.120100).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

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Standards

After successfully completing this course the student will be able to perform the following:

20.0 Design, develop and implement physical, network, host, application, and user security systems for E-business.
21.0 Maintain and monitor security policies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **E-Business Security Technical Certificate**
CIP Number: **0506.120102**
Program Length: **24 credit hours**
SOC Code(s): **15-1071**

This certificate program is part of the E-Business Technology AS/AAS degree program (0506.120100). At the completion of this program, the student will be able to:

20.0 Design, develop and implement physical, network, host, application and user security systems for e-business -- The student will be able to:

20.01 Explain use and purpose of security policies.
20.02 Conduct a security audit.
20.03 Control access to systems, resources and data.
20.04 Explain and manage system security in common Operating Systems.
20.05 Describe concepts of web servers and their role in the network.
20.06 Plan and implement a web server.
20.07 Identify the various hardware and software requirements for a web server.
20.08 Explain how documents and files are stored on a web server.
20.09 Describe different methods for projecting future traffic on a web server.
20.10 Identify the necessary steps to ensure reliability and response of the server.
20.11 Describe and implement the process for effectively organizing a web site.
20.12 Install, configure, and maintain a Web server.
20.13 Publish a web document so that it is easily located through various search engines on the Internet.
20.14 Set up the web server so that dynamic content can be provided to users of the web site.
20.15 Perform corrective, and preventative maintenance on a web server.
20.16 Analyze server log files to determine trends in web server utilization.
20.17 Discuss Internet services operation and the security risk imposed by them on the network.
20.18 Identify vulnerabilities in World Wide Web protocols and counter-measures for securing them.
20.19 Describe the operation of electronic mail and news services protocols and how to effectively secure them.
20.20 Describe the operation of file transfer and printing service protocols and how to effectively secure them.
20.21 Describe the operation of remote access services protocols and how to effectively secure them.
20.22 Describe the operation of real-time conferencing service protocols and how to effectively secure them.
20.23 Properly configure and describe the operation of naming and directory services.
20.24 Describe the operation of authentication and auditing services protocols and how to effectively secure them.
20.25 Describe the operation of administrative services protocols and how to effectively secure them.
20.26 Describe the operation of the IP Security protocol.

20.27 Implement effective measures to secure various service protocols.

21.0 Maintain and monitor security policies--The student will be able to:

21.01 Identify basic network security.
21.02 Describe purpose and use of packet sniffing, firewalls and proxies.
21.03 Define web server security.
21.04 Protect against the risks of directory browsing.
21.05 Assess client security issues (including ActiveX, JavaScript, Cookies, etc.)
21.06 Install and configure network security tools
21.07 Explain the strengths, and weaknesses of cryptography as a security tool
21.08 Describe authentication and identification schemes
21.09 Define secure software.
21.10 Describe the use and purpose of encryption.
21.11 Define the advantages of Secure Socket Layer (SSL).
21.12 Define certificate authority.
21.13 Identify basic aspects of intrusion detection and steps to protect the web server from these threats.
21.14 Explain the history of cryptographic methodology.
21.15 Describe cryptographic attack models.
21.16 Describe the secret key and public key encryption methodology.
21.17 Use hashing techniques.
21.18 Use digital signatures in a network environment.
21.19 Explain applied cryptography.
21.20 Use authentication processes in heterogeneous environments.
21.21 Create secure environment through defensive programming.
21.22 Explain the basic elements of Security Testing and Auditing.
21.23 Describe the capabilities of effective signature filter techniques.
21.24 Explain the importance of architectural design detection of intrusions.
21.25 Describe interoperability aspects of various commercial IDS solutions.
21.26 Define and utilize various network based Intrusion Detection Solutions (IDS).
21.27 Detect various exploitation attempts in a network environment.
21.28 Explain intrusion detection and denial of service.
21.29 Describe techniques for gathering intelligence on intrusion detection and the latest tools and techniques used by hackers.
21.30 Define and recognize structured attacks and differentiate from unstructured attacks.
21.31 Explain management issues related to intrusion detection.
21.32 Implement appropriate security measures following risk analysis.
21.33 Implement appropriate security measures to minimize risks from hackers.
21.34 Issue and manage digital certificates.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **E-Business Software Technical Certificate**
Career Cluster: **Information Technology**

CCC	
CIP Number	0506.120103
Program Type	College Credit Certificate (CCC)
Program Length	21 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1099.12
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the E-Business Technology AS/AAS degree program (0506.120100).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the

instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

09.0 Perform project management activities
13.0 Conduct systems analysis and design.
20.0 Use various software applications, languages, and protocols for E-business environment.
21.0 Support software products for E-business.
22.0 Maintain systems quality and perform testing activities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **E-Business Software Technical Certificate**
CIP Number: **0506.120103**
Program Length: **21 Credit Hours**
SOC Code(s): **15-1099.12**

This certificate program is part of the E-Business Technology AS/AAS degree program (0506.120100). At the completion of this program, the student will be able to:

07.0 Perform project management activities-The student will be able to:

- 07.01 Describe the role of project management (PM) within the organization.
- 07.02 Identify the strengths and weaknesses of various project life cycle designs.
- 07.03 Understand the importance of project scope management.
- 07.04 Compare and contrast project selection methods.
- 07.05 Build a Work Breakdown Structure (WBS), Gantt chart, and Pert Chart and describe those different elements.
- 07.06 Compare and contrast types of cost estimates.
- 07.07 Examine cost control and earned value analysis.
- 07.08 Examine organizational planning, staff acquisition, and team development.
- 07.09 Examine risk identification, quantification, response development, and response control.
- 07.10 Compare and contrast project tracking and project reporting.
- 07.11 Understand change control and configuration control.
- 07.12 Understand subcontracting and outsourcing.
- 07.13 Discuss and analyze project management case study.

13.0 Conduct systems analysis and design --The student will be able to:

- 13.01 Perform a preliminary investigation of a systems project.
- 13.02 Perform a detailed systems investigation and analysis of the project.
- 13.03 Design the input and output for the system.
- 13.04 Design the data files for the systems.
- 13.05 Design the processing flow of the system.
- 13.06 Design a system to insure that only valid data is accepted and processed, completely and accurately.
- 13.07 Establish a project plan for the development and implementation of the systems.
- 13.08 Program and test the system.
- 13.09 Develop the final systems documentation.
- 13.10 Conduct necessary training and file conversion to properly implement the system.
- 13.11 Understand industry-standard models for developing and maintaining software such as the Capability Maturity Model.
- 13.12 Be able to use industry-standard tools such as Unified Modeling Language (UML) to model a systems development project.

20.0 Use various programming software applications, languages and protocols for e-business environment --The student will be able to:

20.01 Explain the key network protocols used with the World Wide Web including Transmission Control Protocol (TCP), Internet Protocol (IP), and Hypertext Transfer Protocol (HTTP)
20.02 Explain how applets differ from applications in terms of program form, operating context, and how they are started.
20.03 Describe and use single- and multi-dimensional arrays.
20.04 Create classes that use inheritance aspects of the object-oriented paradigm.
20.05 Explain the use of keywords such as: static, final, abstract, inner classes, interface, etc.
20.06 Describe the error handling constructs.
20.07 Write a program that reads and writes text files.
20.08 Understand the hierarchy of classes designed for aggregate data such as Collections, and use sets and lists.
20.09 Identify deprecated classes, and explain how to migrate.
20.10 Use the jar tool.
20.11 Explain and use event handling in a GUI.
20.12 Use network utilities to monitor network activity, determine IP addresses, and locate Web servers.
20.13 Differentiate between client-side scripting and server-side scripting.
20.14 Manipulate the objects contained in the Document Object Model (DOM).
20.15 Use variables and constants within a script.
20.16 Use variables, constants, and arithmetic operators to create valid arithmetic expressions.
20.17 Dynamically alter the sequence of script execution.
20.18 Use built-in functions as well as create custom functions, subroutines, and procedures within software using scripting languages.
20.19 Create server pages using languages such as Active Server Pages (ASP) or Java Server Pages (JSP).
20.20 Write programs in a language such as java that allows use of objects like Socket, SocketServer, URL and Connection.
20.21 Create and use server-side include files.
20.22 Use a standard object such as Request to process forms and access server variables
20.23 Use a standard object such as Response to control output from the server.
20.24 Create programs that communicate across the Internet using conventions such as Remote Method Invocation.
20.25 Create and use the Global Application File.
20.26 Understand appropriate use of and demonstrate ability to incorporate and utilize cookies in e-Business software.
20.27 Integrate standard object model components with server pages.
20.28 Create web page using data from a database.
20.29 Implement programs that use local or remote databases with standard protocols.
20.30 Create applications such as Servlets that send HTML pages to Internet clients.
20.31 Use a scripting language on the client side of a distributed program.
20.32 Create and use reusable objects such as Java Beans appropriately in distributed applications.
20.33 Implement levels of security in distributed software applications and applets.
20.34 Read simple UML diagrams, and create UML documents that model programs.
20.35 Use built-in objects for error handling, file creation, and dictionary access in e-Business software.

20.36 Explain protocols designed to allow programming designed to provide network services for applications on small homogenous networks, such as NetBIOS programming
20.37 Understand the use of client-side operating system tools such as Windows redirector.
20.38 Produce software that can interface with operating system services used to broadcast messages within a domain, such as mailslot networking technology.
20.39 Utilize appropriate operating system interfaces to redirect output of one application as input of another through the use of pipe networking technology.
20.40 Describe the protocol address families supported by Winsock and create a socket.
20.41 Create connection-oriented and connectionless Winsock protocols.
20.42 Describe various Winsock I/O models.
20.43 Differentiate between options used with sockets and other operating system techniques used to manipulate device parameters of special files, such as ioctl.
20.44 Describe various name space models.
20.45 Register and query a service.
20.46 Use transport service providers and name space service providers.
20.47 Explain the history of Extensible Markup Language (XML)
20.48 Use the Document Type Definitions that define an XML document structure.
20.49 Use schemas for validating an XML document.
20.50 Incorporate XML code into web documents, and manipulate the contents of an XML document.
20.51 Explain the use and purpose of Xpath and Simple API.
20.52 Write SXLT documents
20.53 Use XSL transformations
20.54 Explain Extensible Hypertext Markup Language (XHTML).
20.55 Explain emerging trends in XML-related technologies.
20.56 Explain and use the different elements that make code easier to read.
20.57 Explain and use the different data types available in scripting languages.
20.58 Explain and use standard control structures such as repetition, selection, and sequence in the appropriate programming language.
20.59 Output data from scripting languages such as PERL to various formats.
20.60 Explain the benefits of using subroutines and libraries in code.
20.61 Debug code from scripting languages such as PERL.
20.62 Explain basic Internet and server-side scripting security issues and common techniques to fix them.
20.63 Use a scripting language such as PERL to create and manage form data submitted over the Internet.
20.64 Examine the use of shopping carts on the Internet and how scripting languages such as PERL can be use in these applications.
20.65 Examine the use of auctions via the Internet and how scripting languages such as PERL can be used.
20.66 Understand industry standard program design techniques.
20.67 Develop the logic for a program using both flowcharting and pseudo code.
20.68 Develop looping and nested looping logic.
20.69 Document programs.
20.70 Develop the logic of: three-level control break program, an extract program, an edit program, a file matching and an update program.
20.71 Interpret a simple table.

21.0 Develop software applications for e-business environment --The student will be able to:

21.01 Explain the architecture of a Wireless Application Protocol (WAP) application
21.02 Identify a variety of WAP micro-browsers.
21.03 Configure Web servers to recognize appropriate MIME types.
21.04 Identify a variety of vendor supplied development toolkits and explain the strengths and weakness of each.
21.05 Explain the purpose of a WAP gateway.
21.06 Evaluate various WAP gateway products and describe the strengths and weaknesses of each.
21.07 Create Wireless Markup Language (WML) decks.
21.08 Create client-side scripts using WML Script.
21.09 Incorporate ease of use features into WAP applications.
21.10 Incorporate dynamic content in WAP applications by using ASP.
21.11 Design software applications that are accessible by a variety of wireless and wired devices.
21.12 Explain alternatives to using ASP to create dynamic content for WAP applications.
21.13 Create a strategy to convert existing HTML based web sites to WAP.
21.14 Build a simple email system accessible from wireless devices.
21.15 Explain security issues and options in a WAP application.
21.16 Integrate the push model of information delivery.
21.17 Explain the architecture of Wireless Telephony applications (WTA) and other wireless architectures.
21.18 Use various HTML elements.
21.19 Explain the various database concepts and vocabulary including: tables, columns, rows, data types, primary and foreign keys, relationships, queries, and relational database design techniques.
21.20 Use operating system services such as a personal web server for database development.
21.21 Explain server security and permissions.
21.22 Evaluate the advantages / disadvantages of different server platforms.
21.23 Explain scripting concepts and syntax.
21.24 Connect common databases using standard protocols.
21.25 Display data from a database using a Web interface.
21.26 Write and modify a database record using a Web interface.
21.27 Enable Web security features and tune Web applications.
21.28 Design and implement a basic shopping cart application.

22.0 Maintain systems quality and perform testing activities -- The student will be able to:

22.01 Identify the advantages and disadvantages of client-server computing.
22.02 Establish controls in a client-server framework.
22.03 Explain software testing methodology.
22.04 Describe the planning, executing and controlling of the testing process.
22.05 Perform Graphical User Interface testing.
22.06 Explain the server applications testing processes.
22.07 Explain testing in a networked application environment.
22.08 Incorporate cross-level functional testing within a data-driven framework-based environment.
22.09 Use client-server testing metrics.

22.10 Explain testing integration on the desktop.
22.11 Explain testing for web-based client-server applications.
22.12 Select and use appropriate automated test tools.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **E-Business Technology Technical Certificate**
Career Cluster: **Information Technology**

CCC	
CIP Number	0506.120104
Program Type	College Credit Certificate (CCC)
Program Length	21 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1099.12
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the E-Business Technology AS/AAS degree program (0506.120100).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the

instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

07.0 Perform project management activities.
09.0 Demonstrate proficiency in the use of web browsers and access to Internet resources.
13.0 Conduct systems analysis and design.
20.0 Perform Web server management activities.
21.0 Support E-Business applications and product development.
22.0 Maintain network infrastructure.
23.0 Perform technical requirements to support UNIX operating system.
24.0 Maintain systems quality and perform testing activities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **E-Business Technology Technical Certificate**
CIP Number: **0506.120104**
Program Length: **21 credit hours**
SOC Code(s): **15-1099.12**

This certificate program is part of the E-Business Technology AS/AAS degree program (0506.120100). At the completion of this program, the student will be able to:

07.0 Perform project management activities-The student will be able to:

07.01 Describe the role of project management (PM) within the organization.
07.02 Identify the strengths and weaknesses of various project life cycle design.
07.03 Understand the importance of project scope management.
07.04 Compare and contrast project selection methods.
07.05 Build a Work Breakdown Structure (WBS), Gantt chart, and Pert Chart and describe those different elements.
07.06 Compare and contrast types of cost estimates.
07.07 Examine cost control and earned value analysis.
07.08 Examine organizational planning, staff acquisition, and team development.
07.09 Examine risk identification, quantification, response development, and response control.
07.10 Compare and contrast project tracking and project reporting.
07.11 Understand change control and configuration control.
07.12 Understand subcontracting and outsourcing.
07.13 Discuss and analyze project management case study.

09.0 Demonstrate proficiency in the use of web browsers and access to internet resources-- The student will be able to:

09.01 Explain the history, purpose and use of the World Wide Web
09.02 Describe proper Internet etiquette and usage.
09.03 Explain how to connect to the Internet
09.04 Explain the purpose and use of browsers and search engines
09.05 Understand and use Web browser tools to navigate the Web.
09.06 Demonstrate proficiency in email technologies by using email, setting up email accounts, and explaining communication and privacy issues specific to email.
09.07 Send electronic messages
09.08 Explain communication issues specific to email
09.09 Set up an e-mail account.
09.10 Participate in an email a web-based discussion group.
09.11 Explain and use proper Usenet electronic bulletin board etiquette.
09.12 Explain the guidelines for evaluating information needs before beginning a search an electronic search
09.13 Explain issues associated with pornography, free speech, censorship, filtering, and copyright on the Web.
09.14 Describe how to critically evaluate online information content.
09.15 Use bookmarks to create a bibliography

09.16 Capture images, text, sound, and data from Web pages
09.17 Work with File Transfer Protocol (FTP) clients
09.18 Identify and use instant messaging software
09.19 Design and publish a simple Web page using HTML and other Web page design software tools.

13.0 Conduct systems analysis and design --The student will be able to:

13.01 Perform a preliminary investigation of a systems project.
13.02 Perform a detailed systems investigation and analysis of the project.
13.03 Design the input and output for the system.
13.04 Design the data files for the systems.
13.05 Design the processing flow of the system.
13.06 Design a system to insure that only valid data is accepted and processed, completely and accurately.
13.07 Establish a project plan for the development and implementation of the systems.
13.08 Program and test the system.
13.09 Develop the final systems documentation.
13.10 Conduct necessary training and file conversion to properly implement the system.
13.11 Understand industry-standard models for developing and maintaining software such as the Capability Maturity Model.
13.12 Be able to use industry-standard tools such as Unified Modeling Language (UML) to model a systems development project.

20.0 Perform web server management activities -- The student will be able to:

20.01 Perform console management in the author and user mode.
20.02 Navigate and create a custom management console.
20.03 Create new user accounts.
20.04 Implement groups into a domain.
20.05 Change the domain mode.
20.06 Manage software settings, scripts, and security settings.
20.07 Manage administrative templates.
20.08 Manage folder redirection.
20.09 Configure and administer network printers.

21.0 Support e-business applications and product development -The student will be able to:

21.01 Identify the different components to systems development life cycle and how they are interrelated.
21.02 Identify deliverables for user project and build subprojects within lifecycle components.
21.03 Create physical structure of web-based architecture.
21.04 Create requirements for business request, develop web components necessary to satisfy request and test for acceptance.
21.05 Use web browser and web authoring tools.
21.06 Write required queries to get required answer sets.

22.0 Maintain network infrastructure --The student will be able to:

22.01 Analyze the infrastructure for E-business, the Internet, packet-switched networks, several Web markup languages, and popular Internet applications, protocols, and utility programs.
22.02 Identify Web server hardware and discus performance evaluation.
22.03 Describe security threat countermeasures, including anti-virus software and encryption.
22.04 Identify basic components of electronic payment systems.
22.05 Identify how to create and maintain an effective Web presence and brand.
22.06 Describe various Electronic Data Interchange components.
22.07 Define and explain virtual communities and Web portals.
22.08 Identify challenges of a global business regarding culture, legal and financial impacts, and differing languages.
22.09 Identify the planning stages of the E-Business Project.

31.0 Perform technical requirements to support UNIX operating system -The student will be able to:

31.01 Explain the history of UNIX
31.02 Explain basic command syntax for approximately 100 common shell commands governing the file-system, printing and process control.
31.03 Identify various UNIX editors and use the vi editor.
31.04 Schedule and reprioritize processes running under UNIX.
31.05 Use commands to get information and communicate with remote users.
31.06 Search for strings of text in files using shell meta-characters.
31.07 Use Awk to generate reports or filter text.
31.08 Use Korn shell scripts to control flow, input, output and jobs.
31.09 Use C shell variables and arrays.
31.10 Troubleshoot various system problems.

32.0 Maintain systems quality and perform testing activities -- The student will be able to:

32.01 Identify the advantages and disadvantages of client-server computing.
32.02 Establish controls in a client-server framework.
32.03 Explain software testing methodology.
32.04 Describe the planning, executing and controlling of the testing process.
32.05 Perform Graphical User Interface testing.
32.06 Explain the server applications testing processes.
32.07 Explain testing in a networked application environment.
32.08 Incorporate cross-level functional testing within a data-driven framework-based environment.
32.09 Use client-server testing metrics.
32.10 Explain testing integration on the desktop.
32.11 Explain testing for web-based client-server applications.
32.12 Select and use appropriate automated test tools.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **E-Business Ventures Technical Certificate**
Career Cluster: **Information Technology**

CCC	
CIP Number	0506.120105
Program Type	College Credit Certificate (CCC)
Program Length	24 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1099.12
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the E-Business Technology AS/AAS degree program (0506.120100).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the

instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

11.0 Understand issues related to E-Business.
18.0 Compare and contrast E-Business with traditional business.
19.0 Identify, classify, and demonstrate management activities for E-Business.
20.0 Identify legal and ethical issues for E-business.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **E-Business Ventures Technical Certificate**
CIP Number: **0506.120105**
Program Length: **24 Credit Hours**
SOC Code(s): **15-1099.12**

This certificate program is part of the E-Business Technology AS/AAS degree program (0506.120100). At the completion of this program, the student will be able to:

11.0 Understand issues related to e-business-- The student will be able to:

- 11.01 Explain the difference between intranet and internet and the role of each in e-Business.
- 11.02 Explain the history, purpose and use of the World Wide Web and how it has enabled e-Business
- 11.03 Describe the rise of various e-Business models such as information and content models, broadcast/content aggregations models, interactive models, and content provider models.
- 11.04 Explain security issues related to electronic payment.
- 11.05 Explain issues of advertising, marketing and solicitation activities affecting e-business.

18.0 Compare and contrast e-business with traditional business models- The student will be able to:

- 18.01 Describe the evolution of e-business, how it changed the marketplace, and the benefits to society.
- 18.02 Define e-business and its categories.
- 18.03 Describe how business operations have changed due to e-business.
- 18.04 Explain the basic business models of electronic marketing.
- 18.05 Identify critical success factors for electronic marketing.
- 18.06 Explain the impact of the Internet on customers and markets for businesses.
- 18.07 Describe consumer buying behavior and organizational buying behavior.
- 18.08 Explain how service industries conduct business electronically.
- 18.09 Describe several innovative applications in the service sector.
- 18.10 Explain how business-to-business commerce is conducted.
- 18.11 Describe the application and key technologies for business- to-business e-commerce models.
- 18.12 Describe the relationship between the Internet, intranet and extranet.
- 18.13 Describe the typical electronic payment system.
- 18.14 Identify the various payment options in e-commerce.
- 18.15 Explain the strategic planning issues for e-business
- 18.16 Identify the critical success factors of an e-business project/venture.
- 18.17 Discuss contractual issues and copyright infringement on the Web.
- 18.18 Explain the global economics and its impact e-business.
- 18.19 Describe the major components and impact of Web-based economics

19.0 Identify, classify and demonstrate management activities for e-business—The student will be able to:

19.01 Define the role of the entrepreneur in business-in the United States and across the World.
19.02 Describe the entrepreneurial profile.
19.03 Discuss the role of the internet in helping small business expand their market opportunities both in the United States and abroad.
19.04 Explain the importance of strategic management to business.
19.05 Describe the components of a marketing plan and explain the benefits of preparing one.
19.06 Describe how to prepare financial statements & use them to manage the business.
19.07 Describe effective pricing strategies.
19.08 Discuss the links among pricing, image, and competition.
19.09 Explain what seed capital is and why it is so important to the entrepreneurial process.
19.10 Explain the difference in the three types of capital that small businesses require: Fixed, Working and Growth.
19.11 Explain the stages in the location decision.
19.12 Describe the location criteria and outline the basic location options for retail and service business.
19.13 Explain purchasing, quality control, vender analysis and managing inventory while using technology to gain a competitive edge.
19.14 Explain the challenges involved in the entrepreneur's role as leader and what it takes to be a successful leader.
19.15 Learn management succession and risk management strategies in family business together with ethics and social responsibility.
19.16 Describe, explain and discuss business's responsibility to employees, customers, investors and the community.
19.17 Describe management's historical role in business operations.
19.18 Compare and contrast different management philosophies.
19.19 Compare and contrast the employees' personal needs with those of the organization.
19.20 Describe methods managers can use to deal with management politics.
19.21 Describe the nature of management's legal environment for traditional and electronic environments.
19.22 Describe the planning process of managers.
19.23 Discuss the characteristics and functions of an organization chart.
19.24 Describe the act and benefits of delegation.
19.25 Summarize the components of job descriptions and specifications.
19.26 Define and describe the activities involved in making a job analysis.
19.27 Discuss potential problems in evaluating employees and methods to avoid problems.
19.28 Discuss strategies managers may use to build and sustain high morale and motivation.
19.29 Describe methods of direct and indirect compensation.
19.30 Describe various employee relations practices.
19.31 Summarize strategies to improve personal and organizational communication.
19.32 Discuss the role of information systems in the control system.
19.33 Discuss the steps in the basic decision making process.

19.34 Describe several factors that influence decision-making.
19.35 Distinguish among management functions.
19.36 Demonstrate knowledge of the relationship between authority and responsibility to task accomplishment.
19.37 Select the most effective communication systems.
19.38 Identify problems and make an appropriate decision.

20.0 Identify legal and ethical issues for e-business -- The student will be able to:

20.01 Describe the procedure to obtaining protection under each intellectual property law.
20.02 Describe and recognize material that is defamatory.
20.03 Explain the right of publicity and the right of privacy.
20.04 Explain copyright assignment and the Visual Artists Rights Act.
20.05 Discuss licensing text, photos, films, television clips, characters, and games, Domain name registration, cybersquatting and anti-cybersquatting regulations.
20.06 Describe the importance in choosing a strong trademark.
20.07 Understand basic laws that apply to e-commerce.
20.08 Explain how Article Two of the UCC that applies to the sale of goods involved in E-business.
20.09 Discuss current US laws that regulate e-business, such as the Uniform Computer Information Transactions Act, clickwraps, sales tax, and advertising.
20.10 Explain the meaning of linking, framing and caching.
20.11 Discuss the permission required for linking, revenue-sharing agreements, and liability issues pertaining to linking.
20.12 Discuss e-mail litigation, including anti-spam laws.
20.13 Describe licensing music for use.
20.14 Discuss copyright issues important to ISPs.
20.15 Explain other liability issues for ISPs, such as, defamation, privacy, trademark and patent.
20.16 Discuss when to use trademark protection and trade secret protection for their property.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **IT Security**
Career Cluster: **Information Technology**

	AS	AAS
CIP Number	1506.120106	0506.120106
Program Type	College Credit	College Credit
Standard Length	63 credit hours	63 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1071.01	15-1071.01
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as Database Security Professionals and E-Commerce Security Professionals in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to work in Internet, intranet, extranet, and enterprise environments; installing, configuring, designing, and managing secure database and E-commerce resources.

Program Structure

This program is a planned sequence of instruction consisting of 63 hours.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Program Length

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. The standard length of this program is 63 credit hours according to Rule 6A-14.030, F.A.C.

Certificate Programs

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).This AS/AAS degree program includes the following College Credit Certificates:

Database & E-Commerce Security CCC (0506.120111) – 18 credit hours

Standards for the above certificate program are contained in separate curriculum frameworks.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Demonstrate an understanding of computer hardware.
02.0 Demonstrate an understanding of networked environments, hardware, and software.
03.0 Install and configure secure network systems software and utilities.
04.0 Demonstrate proficiency with Internet structure, organization, and navigation.

05.0 Demonstrate an understanding of network access control systems and methodology.
06.0 Describe cryptography concepts, standards, and applications.
07.0 Perform telecommunications and network security activities.
08.0 Demonstrate an understanding of Database Management Systems.
09.0 Perform administrative tasks related to database security.
10.0 Demonstrate an understanding of E-commerce.
11.0 Perform tasks related to e-commerce security.
12.0 Perform Web site management activities.
13.0 Design and implement physical security measures.
14.0 Perform operations and security management practices.
15.0 Employ applications and systems development security techniques.
16.0 Develop business continuity and disaster recovery plans
17.0 Describe ethical issues, pertinent laws, and how to conduct investigations.
18.0 Perform general organizational computing workplace competencies.
19.0 Perform project planning and management activities.
20.0 Perform documentation and technical reference activities.
21.0 Demonstrate employability skills.
22.0 Demonstrate professional development skills.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **IT Security**
CIP Numbers: **1506.120106 AS, 0506.120106 AAS**
Program Length: **63 credit hours**
SOC Code(s): **15-1071.01**

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. At the completion of this program, the student will be able to:

01.0 Demonstrate an understanding of computer hardware-The student will be able to:

- 01.01 Describe multiple numbering systems used to represent instructions and data, including binary, octal, decimal, and hexadecimal.
- 01.02 Identify the architecture of major hardware platforms.
- 01.03 Describe the functions of major hardware components of a computer system.
- 01.04 Discuss the potential impact of emerging hardware technologies.
- 01.05 Perform preventive maintenance tasks on microcomputer systems.
- 01.06 Set up and configure computer systems and peripherals.
- 01.07 Configure the Basic Input/Output System (BIOS) of a computer system.
- 01.08 Install and configure storage devices, controllers, and network interfaces.

02.0 Demonstrate an understanding of networked environments, hardware, and software - The student will be able to:

- 02.01 Discuss fundamental network concepts such as topology, protocols, architecture, and internetworking
- 02.02 Define all layers in the Open Systems Interconnect (OSI) and Transmission Control Protocol/Internetworking Protocol (TCP/IP) network protocol models
- 02.03 Discuss the nature of Internetworking Protocol (IP) addresses and Media Access Control (MAC) addresses, and mapping between protocol addressing schemes
- 02.04 Describe the functions and hardware requirements for current popular network servers for such services as: Domain Name Service (DNS), Dynamic Host Configuration Protocol (DHCP), e-mail, the World Wide Web (WWW), proxy, etc.)
- 02.05 Describe the major functions and hardware requirements of network client hardware components
- 02.06 Describe current link technologies such as twisted-pair, coaxial, fiber optic, and wireless
- 02.07 Describe the major functions of network connectivity hardware, such as hubs, repeaters, bridges, routers, switches, and gateways
- 02.08 Describe the function of network storage devices and other peripherals such as a Redundant Arrays of Inexpensive Disks (RAID) and CD-ROM towers

03.0 Install and configure secure network systems software and utilities-The student will be able to:

- 03.01 Install and configure current leading system software, drivers, and service packs.

03.02 Install, configure and set up a proxy server and a gateway.
03.03 Discuss the functions of authentication protocols and Virtual Private Networks (VPNs).
03.04 Configure e-commerce servers and database servers.
03.05 Install and configure mailing list servers, chat servers, and newsgroup servers.
03.06 Use system software to perform routine maintenance tasks such as backup, hard drive defragmentation, etc.
03.07 Install and configure a secure desktop client operating system.
03.08 Describe modifications necessary to an operating system (such as modifying parameters, how to handle conflicting interrupts, etc.) when installing, configuring, and upgrading typical applications software.
03.09 Install and configure client software for network-based applications such as e-mail, Web browsing, terminal emulation, file transfer, group conferencing, database, etc.
03.10 Install and configure current popular network servers for such services as: Domain Name Service (DNS), Dynamic Host Configuration Protocol (DHCP), e-mail, the World Wide Web (WWW), proxy service, etc.).

04.0 Demonstrate proficiency with Internet structure, organization, and navigation-The student will be able to:

04.01 Describe Internet structure and administration, including such topics as Requests For Comments (RFCs) and the Domain Name System (DNS).
04.02 Describe common Internet services and port numbers.
04.03 Demonstrate the use of internetworking protocols, including: Hypertext Transfer Protocol (HTTP), File Transfer Protocol (FTP), e-mail protocols such as Simple Mail Transfer Protocol (SMTP) and Post Office Protocol (POP3), Telnet, etc.).
04.04 Differentiate between push and pull technologies.
04.05 Demonstrate the use of typical remote access mechanisms such as Telnet.
04.06 Describe the data format and proprietary nature of commonly used Internet file types.
04.07 Demonstrate use of Internet clients and services such as e-mail, Web browsers, search engines, newsgroups, mailing lists, chat rooms, file transfer clients, etc.

05.0 Demonstrate an understanding of network access control systems and methodology-The student will be able to:

05.01 Specify by access control mechanisms what users can do, which resources they can access, and what operations they can perform on a system
05.02 Compare and contrast several access control techniques, including access control lists, discretionary, mandatory, lattice-based, rule-based, and role-based access control
05.03 Administer computer, group, and user accounts
05.04 Manage policies, rights, permissions, and passwords for users and/or groups of users
05.05 Demonstrate an understanding of various access control models including the Bell-LaPadula, Biba, Clark and Wilson, and State Machine Models
05.06 Oversee password and PIN selection, management, and control
05.07 Demonstrate an understanding of alternative methods to identification and authentication, including characteristic-based or biometric techniques, tokens, tickets, one-time passwords, and single sign-on techniques

05.08 Implement centralized/remote authentication access controls such as RADIUS and TACACS
05.09 Implement and manage decentralized access controls such as domains and trusts relationships
05.10 Analyze methods of server attack, including brute force, denial of service, spoofing, spamming, sniffers, hackers, and crackers
05.11 Demonstrate an understanding of the different types of intrusions and the different methods of intrusion detection, including data extraction, sampling, recognition and traffic analysis
05.12 Monitor the network using various forms of intrusion detection resources to detect attacks
05.13 Investigate audit trails for signs of network intrusions
05.14 Perform penetration testing to find weaknesses in the access control systems.

06.0 Describe cryptography concepts, standards, and applications-The student will be able to:

06.01 Demonstrate an understanding of the encryption/decryption process.
06.02 Demonstrate an understanding of the basic functions involved in key management including creation, distribution, verification, revocation, destruction, storage, recovery, and life span of keys.
06.03 Utilize various forms of cryptography, digital certificates, and digital signatures to achieve confidentiality, integrity, authentication, and non-repudiation in an enterprise data communications network.
06.04 Discuss the creation and use of digital certificates and digital signatures to provide authentication of users and verification of data integrity in network communications.
06.05 Employ cryptographic algorithms such as DES, RSA, MD5 and DSA.
06.06 Identify the strengths and weaknesses of cryptographic algorithms and the effects of key length.
06.07 Implement current popular key distribution methods including manual, Kerberos™, and Internet Security Association and Key Management Protocol (ISAKMP).
06.08 Utilize application and network-based protocols such as Secure Socket Layer (SSL), Secure HyperText Transfer Protocol (SHTTP), and Internetworking Protocol Security (IPSEC).
06.09 Describe the use of hardware components such as smart cards and tokens.

07.0 Perform telecommunications and network security activities – The student will be able to:

07.01 Utilize protocol layering models such as the Open Systems Interconnection (OSI) model in analyzing network security threats.
07.02 Evaluate the security implications involved with the various physical media types such as fiber optics, twisted pair, and wireless communications.
07.03 Describe security concerns with using certain network topologies such as star, bus, mesh, and ring.
07.04 Configure authentication protocol services such as RADIUS/TACACS to provide dial-in authentication and security.
07.05 Employ network monitors and packet sniffers to identify security threats.
07.06 Implement security measures using hardware and software such as firewalls, routers, switches, gateways, and proxies.

07.07 Discuss the security vulnerabilities of the Transmission Control Protocol/Internetworking Protocol (TCP/IP) protocol stack.
07.08 Configure Network Layer security protocols such as Internetworking Protocol Security (IPSEC).
07.09 Configure Transport Layer security protocols such as Secure Socket Layer (SSL).
07.10 Utilize Secure Multipurpose Internet Mail Extensions (S/MIME), Secure Socket Layer (SSL) and other Application Layer security protocols.
07.11 Perform connection verification and authentication using Challenge Handshake Authentication Protocol (CHAP) and Password Authentication Protocol (PAP).
07.12 Demonstrate an understanding of how wide area network serial line protocols such as Frame relay, X.25, High-level Data Link Control (HDLC), Point-to-Point Protocol (PPP) and Integrated Services Digital Network (ISDN), and Digital Subscriber Line (DSL) work.
07.13 Implement secure data communication techniques such as Virtual Private Networks (VPNs), tunneling, Network Address Translation (NAT), and transmission logging.
07.14 Develop secure e-mail, facsimile, and voice communication procedures to protect against network attacks such as flooding, eavesdropping, sniffing, spamming, etc. and describe appropriate countermeasures.
07.15 Employ alarms and signals to alert network security administrators of intrusions.

08.0 Demonstrate an understanding of Database Management Systems-The student will be able to:

08.01 Compare the major types of databases including relational, flat file, distributed and object-oriented databases.
08.02 Describe the concept of relational database concepts including tables, entity-relationships, queries, and normalization.
08.03 Analyze the various components of a database management system.
08.04 Install and configure database server software from leading vendors.
08.05 Perform database administration tasks using the Structured Query Language (SQL).
08.06 Demonstrate an understanding of transactions processing and concurrency control.
08.07 Perform database backup and recovery operations.
08.08 Employ techniques to ensure database integrity and security.

09.0 Perform administrative tasks related to database security-The student will be able to:

09.01 Develop database security guidelines.
09.02 Monitor database security systems.
09.03 Manage web database security.
09.04 Verify security compliance.
09.05 Secure backup processes.
09.06 Verify backup processes.

10.0 Demonstrate an understanding of e-commerce-The student will be able to:

10.01 Describe e-commerce and its impact on business and society.
10.02 Differentiate between the various e-commerce business models.

10.03 Describe the development of an e-commerce business plan.
10.04 Discuss e-commerce revenue streams and e-commerce market sectors.
10.05 Develop e-commerce marketing plan.
10.06 Discuss the steps necessary to maintain transaction integrity.
10.07 Identify components and procedures necessary to process credit card transactions.

11.0 Perform tasks related to e-commerce security-The student will be able to:

11.01 Manage digital certificates.
11.02 Maintain integrity in transaction storage and reporting systems.
11.03 Protect credit card, personal, banking, and "bill to" and "ship to" information in transaction processes.
11.04 Oversee inventory control.
11.05 Maintain email security related to e-commerce.
11.06 Review third-party transaction processing.
11.07 Assist in evaluating e-commerce platform vulnerabilities.

12.0 Perform Web site management activities-The student will be able to:

12.01 Describe the process of obtaining an Internet domain name and mapping it to an Internet Protocol (IP) address.
12.02 Compare features of currently available Web site management tools.
12.03 Configure current Web server software such as Apache Web Server and Microsoft Internet Information Server (IIS).
12.04 Use current Web server software to create and maintain a secure Web site.
12.05 Use Web site access tracking and analysis tools to evaluate the security of a Web server.

13.0 Design and implement physical security measures-The student will be able to:

13.01 Identify the physical threats to an enterprise’s resources that include the employees, facilities, data, equipment, support systems, media, and supplies they utilize.
13.02 Diagnose an enterprise’s physical vulnerabilities to threats from natural disasters such as fire, flooding, and power loss.
13.03 Specify possible countermeasures to physically protect an enterprise’s resources and sensitive information.
13.04 Develop a list of physical facility requirements to secure the premises.
13.05 Evaluate the applicability of technical controls such as smart cards, access logs, and intrusion detection systems.

14.0 Perform operations and security management practices-The student will be able to:

14.01 Perform personnel administrative management operations, including specifying job requirements, background checking, job rotation and termination procedures.
14.02 Implement anti-virus solutions on an enterprise-wide basis.
14.03 Perform backups of critical information.
14.04 Protect the privacy of personal data.
14.05 Demonstrate proper handling including marking, handling, storage and destruction of sensitive information and media

14.06 Demonstrate an understanding of different control types, such as directive, preventive, detective, corrective, and recovery controls.
14.07 Determine what resources, including hardware/software, password files, source code, storage and logs, require protection.
14.08 Compare the advantages and disadvantages of internal versus external audits.
14.09 Perform compliance checks on user adherence to security policies.
14.10 Identify different types of monitoring including event, hardware, and illegal software.
14.11 Utilize monitoring tools and techniques such as trend analysis, traffic analysis and reporting mechanisms.
14.12 Implement countermeasures to defend against threats such as fraud, theft, employee sabotage, espionage, terrorism, and hackers.
14.13 Perform penetration testing activities including sniffing, eavesdropping, dumpster diving, and social engineering.
14.14 Understand principles of risk management and asset valuation.
14.15 Monitor server information for defamatory statements and privacy rights infractions.
14.16 Manage software licenses and enforce compliance within the organization.

15.0 Employ applications and systems development security techniques- The student will be able to:

15.01 Describe the stages of the system development life cycle.
15.02 Develop and document object-oriented computer programs employing structured programming techniques.
15.03 Analyze the controls that are included within systems and applications software and those used in the development of agents, applets, software, databases, data warehouses and knowledge-based systems.
15.04 Implement features to ensure data and application integrity, security and availability.
15.05 Analyze distributed environment application issues including agents, applets, and objects.
15.06 Analyze local environment application issues including viruses, Trojan horses, logic bombs and worms.
15.07 Analyze key database and data warehousing issues including aggregation, data mining, inference and poly-instantiation
15.08 Develop multilevel security schemes for databases and data warehouses.
15.09 Compare different forms of data/information storage including primary, secondary, real, virtual, random, volatile, and sequential.
15.10 Describe different aspects of application and database security control architectures, including process isolation, hardware segmentation, separation of privilege, layering, abstraction and security kernels.
15.11 Understand the difference between supervisory and user modes of operation.
15.12 Identify various levels of application integrity including network, operating system, database, and file level integrity.
15.13 Define the various types of computer viruses and malicious code and the roles that hackers, crackers, phreaks, and virus writers play in developing and utilizing malicious code.
15.14 Formulate countermeasures to defend against or detect viruses and malicious code.
15.15 Utilize anti-virus software and develop policies to provide enterprise-wide anti-

virus protection.

15.16 Employ countermeasures to defend against attacks such as brute force and replay attacks.

16.0 Develop business continuity and disaster recovery plans-The student will be able to:

16.01 Perform a business impact assessment, including components such as an emergency assessment, specifying business success and critical business functions, establishing priorities, and developing alternative means of accomplishing objectives.
16.02 Specify the necessary capabilities of alternative business sites such as cold, warm, hot and mobile sites to be used in the case of a disaster.
16.03 Develop business continuity, disaster containment, and disaster recovery plans for disasters such as such as floods, fires, power outages, strikes, hardware/software failures, and bombings addressing: protection of physical assets, emergency response, personnel notification, backups and off-site storage, utilities, external communications, and logistics and supplies.
16.04 Describe the process of performing routine scheduled maintenance of fire control systems and building utilities such as power, ventilation, and water.
16.05 Conduct a business continuity project, including scope and planning.
16.06 Develop a training program for personnel regarding business continuity/recovery plans.

17.0 Describe ethical issues, pertinent laws, and how to conduct investigations-The student will be able to:

17.01 Understand the major categories and types of laws as to how they relate to E-commerce, including criminal law, civil law and administrative law.
17.02 Develop institutional policies and practices to conform to or supplement existing laws regarding data privacy and intellectual property rights.
17.03 Describe abnormal and suspicious activity as it relates to database and e-commerce security.
17.04 Analyze potential data security threats such as fraud or collusion.
17.05 Develop legal institutional policies and practices to protect against purposeful violations of data integrity.
17.06 Identify the major categories of computer crime and attacks, including military, business, financial, terrorist, grudge and “fun” attacks.
17.07 Develop legal institutional policies and practices to conduct an investigation of purposeful violations of data integrity or existing e-commerce laws, including: the collection and preservation of evidence; confiscation of equipment, software and data; interrogation of suspected violators; and reporting of incidents to the appropriate authorities.
17.08 Discuss major ethical and legal issues related to Internet use.

18.0 Perform general organizational computing workplace competencies- The student will be able to:

18.01 Follow oral and written instructions.
18.02 Prepare, outline, and deliver a short oral presentation.
18.03 Prepare visual material to support an oral presentation.
18.04 Participate in group discussions as a member and as a leader.

18.05 Interpret appropriate information from graphics, maps, or signs.
18.06 Demonstrate self-motivation and responsibility to complete an assigned task.
18.07 List the steps in problem solving.
18.08 Identify and discuss issues contained within professional codes of conduct.
18.09 Identify and discuss intellectual property rights and licensing issues.
18.10 Identify potential sources of employee/employer or employee/employee conflict and discuss possible approaches to resolve such disagreements.
18.11 Use appropriate courtesy, manners, and dress in the workplace.
18.12 Apply principles and techniques for being a productive, contributing member of a team.
18.13 Identify and use acceptable strategies for resolving conflict in the workplace.
18.14 Apply principles and techniques for working productively with people of diverse cultures and backgrounds.
18.15 Identify techniques for stress management and prevention of job burnout.
18.16 Use appropriate communication skills, telephone etiquette, courtesy, and manners when dealing with individuals lacking a technical background.

19.0 Perform project planning and management activities-The student will be able to:

19.01 Apply effective time management skills.
19.02 Describe appropriate measures for planning and managing a large project.
19.03 Define an implementation schedule for a large project.
19.04 Describe appropriate measures for planning and implementing corporate-wide upgrade of hardware and software.
19.05 Identify examples of effective end-user training strategies and techniques.

20.0 Perform documentation and technical reference activities-The student will be able to:

20.01 Use technical vocabulary appropriately
20.02 Locate information in printed and online technical references
20.03 Prepare documentation to track: physical inventory, regulation and license compliance, hardware and software modifications and upgrades, security breaches and countermeasures, and the current e-commerce security environment

21.0 Demonstrate employability skills-The student will be able to:

21.01 Identify sources of employment opportunities.
21.02 Discuss employer expectations regarding attendance, punctuality, initiative, teamwork, etc.
21.03 Discuss employee rights regarding privacy, discrimination, due process, safety, etc.
21.04 Explain the importance of a written job description.
21.05 Identify methods for securing employment references.
21.06 Compose a letter of application and a resume.
21.07 Complete an employment application.
21.08 Classify behaviors considered appropriate or inappropriate in a job interview situation.
21.09 Demonstrate job interview skills.
21.10 Compose a follow-up letter.
21.11 Compose a letter of resignation.

22.0 Demonstrate professional development skills-The student will be able to:

22.01 Discover corporate strategies and policies.
22.02 Develop and maintain professional contacts.
22.03 Develop mentor relationships.
22.04 Anticipate future industry trends.
22.05 Describe options for continuing education.
22.06 Read industry journals and magazines.
22.07 Attend seminars, workshops, and tradeshows.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Technology Project Management**
Career Cluster: **Information Technology**

	AS	AAS
CIP Number	1506.120107	0506.120107
Program Type	College Credit	College Credit
Standard Length	63 credit hours	63 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1099.11	15-1099.11
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as project managers and professionals incorporating IT project management strategies in their business activities in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to balance of business and technology components and allows the student to gain additional skills in the area of Project Management.

Program Structure

This program is a planned sequence of instruction consisting of 63 hours.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Program Length

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. The standard length of this program is 63 credit hours according to Rule 6A-14.030, F.A.C.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Demonstrate proficiency in the use of microcomputers and their peripherals
02.0 Demonstrate proficiency in the use of microcomputer software
03.0 Demonstrate proficiency in the use of microcomputer operating systems software
04.0 Demonstrate proficiency in the use of Web browsers to access Internet services
05.0 Identify, classify and demonstrate IT activities
06.0 Perform accounting activities
07.0 Identify legal and ethical issues relative to the IT environment
08.0 Perform Project Management Activities
09.0 Use various Project Management software applications and languages
10.0 Conduct systems analysis and design
11.0 Perform human resource management activities
12.0 Use various models and strategies for Project Management
13.0 Perform customer service activities for Project Management
14.0 Demonstrate employability skills

15.0 Demonstrate appropriate communication skills
16.0 Demonstrate human relations skills
17.0 Perform decision-making activities

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Technology Project Management**
CIP Numbers: **1506.120107 AS, 0506.120107 AAS**
Program Length: **63 credit hours**
SOC Code(s): **15-1099.11**

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. At the completion of this program, the student will be able to:

01.0 Proficiency in the use of microcomputers and their peripherals. The student will be able to:

- 01.01 Identify and explain the main purpose of various microcomputer hardware devices.
- 01.02 Demonstrate the proper use and maintenance of printers.
- 01.03 Demonstrate the proper use and maintenance of scanners.
- 01.04 Demonstrate the proper use and maintenance of CD-RWs.
- 01.05 Demonstrate the proper use and maintenance of zip drives.
- 01.06 Demonstrate the proper use and maintenance of DVDs.
- 01.07 Demonstrate the proper use and maintenance of digital cameras.
- 01.08 Demonstrate the proper use and maintenance of Web cameras.
- 01.09 Demonstrate the proper use and maintenance of backup systems.
- 01.10 Demonstrate the proper use of basic hand tools.

02.0 Proficiency in the use of web browsers and access to Internet resources. The student will be able to:

- 02.01 Explain the history, purpose and use of the World Wide Web.
- 02.02 Describe proper Internet etiquette and usage.
- 02.03 Explain how to connect to the Internet.
- 02.04 Explain the purpose and use of browsers and search engines.
- 02.05 Use a Web browser to navigate the Web.
- 02.06 Send electronic messages.
- 02.07 Explain communication issues specific to email.
- 02.08 Set up an email account.
- 02.09 Participate in an email discussion group.
- 02.10 Explain and use proper Usenet etiquette.
- 02.11 Explain the guidelines for evaluating information needs before beginning a search.
- 02.12 Explain issues associated with pornography, free speech, censorship, filtering, and copyright on the Web.
- 02.13 Describe how to critically evaluate online information content.
- 02.14 Use bookmarks to create a bibliography.
- 02.15 Capture images, text, sound, and data from Web pages.
- 02.16 Work with File Transfer Protocol (FTP) clients.
- 02.17 Identify and use instant messaging software.

02.18 Design and publish a simple Web page.

03.0 Proficiency in the use of microcomputer software. The student will be able to:

03.01 Identify and use personal productivity software including word processing, spreadsheet, database, presentation, communication, and appointment scheduling applications
03.02 Identify and use Project Management software.
03.03 Identify and use e-Mail software.
03.04 Identify and use Web page design software.
03.05 Identify and use anti-virus software.
03.06 Identify and use report writing software.
03.07 Identify and use standards and methodology software.
03.08 Identify and use auditing software.
03.09 Identify and use data modeling software.
03.10 Identify and use distance learning software.

04.0 Proficiency in microcomputer operating systems software. The student will be able to:

04.01 Describe the historical development of computer operating systems.
04.02 Describe the major hardware and related software of microcomputers.
04.03 Describe the various operating systems, including: Windows, Unix, Linux, etc.
04.04 Explain system and application architectures.
04.05 Describe various disk formats.
04.06 Describe the file system functions.
04.07 Demonstrate knowledge of data processing concepts.

05.0 Information technology activities. The student will be able to:

05.01 Describe how business operations have changed due to Information Technology.
05.02 Classify the Information Technology components.
05.03 Describe the use of computing and software for business.
05.04 Describe the use of communication and research for business.
05.05 Describe the use of Web publishing for business.
05.06 Describe the use of digital media for business.
05.07 Identify fundamental financial analysis concepts.
05.08 Describe financial analysis tools.
05.09 Identify the phases of a project.
05.10 Demonstrate the need to validate requirements.
05.11 Describe change management.
05.12 Describe the fundamentals of risk management.
05.13 Identify estimating concepts.
05.14 Identify and create organizational goals and objectives.
05.15 Demonstrate the ability to work collaboratively with other individuals or teams.

06.0 Accounting activities. The student will be able to:

06.01 Record transactions in a general journal
06.02 Post entries from a general journal to a general ledger
06.03 Prepare an income statement
06.04 Prepare an owner's equity statement

06.05 Prepare a balance sheet
06.06 Journalize and post adjusting entries
06.07 Journalize and post closing entries
06.08 Prepare a post closing trial balance
06.09 Prepare checks and stubs
06.10 Endorse checks using special endorsements
06.11 Prepare a deposit slip and adjust checkbook
06.12 Prepare a bank reconciliation
06.13 Maintain petty cash records
06.14 Record transactions in special journals
06.15 Post journal entries to subsidiary ledgers
06.16 Prepare payroll records
06.17 Interpret financial statements

07.0 Legal and ethical issues relative to the information technology environment. The student will be able to:

07.01 Discuss the types of works that are protected by intellectual property laws including copyrights, patents, trademarks and trade secrets.
07.02 Discuss the basic elements of a contract.
07.03 Discuss e-mail litigation, including anti-spam laws.
07.04 Discuss e-mail use and ownership.
07.05 Describe customer and employee privacy issues and safeguards.
07.06 Develop examples of acceptable use policies.
07.07 Compare organizational codes of ethics.
07.08 Research industry standards and codes of conduct for Information Technology Professionals.
07.09 Write a personal code of ethics.

08.0 Project management activities. The student will be able to:

08.01 Recognize the critical importance of processes in managing projects.
08.02 Distinguish between project management processes and product-oriented processes.
08.03 Sequence the groups of processes, as they would normally occur when managing a complex project.
08.04 Identify the components of the process interactions.
08.05 Describe the role of project management (PM) within the organization.
08.06 Identify the strengths and weaknesses of various project life cycle designs.
08.07 Understand the importance of managing project scope.
08.08 Compare and contrast project selection methods.
08.09 Build a Work Breakdown Structure (WBS), Gantt chart, and Pert Chart and describe the elements of each.
08.10 Compare and contrast types of cost estimates.
08.11 Examine cost control and earned value analysis.
08.12 Examine organizational planning, staff acquisition, and team development.
08.13 Examine risk identification, quantification, response development, and response control.
08.14 Compare and contrast project tracking and project reporting
08.15 Change control and configuration control.
08.16 Identify the costs and benefits of subcontracting and outsourcing.

08.17 Apply fundamental financial analysis concepts to project management tasks.
08.18 Use formal cost and schedule control and variance analysis to detect pending problems so the problems can be corrected or workaround strategies can be implemented.
08.19 Track the expenses and costs of a project and compare them to the project plan.
08.20 Explain how financial analysis tools are used in the financial management of a project.
08.21 Explain how a project manager can control and manage projects and contract finances.

09.0 Project management software applications and languages. The student will be able to:

09.01 Demonstrate proficiency with accounting software.
09.02 Demonstrate proficiency with auditing software.
09.03 Demonstrate proficiency with customer relations software.
09.04 Demonstrate proficiency with enterprise resource software.
09.05 Demonstrate proficiency with data modeling software.
09.06 Demonstrate proficiency with remote controlling software.
09.07 Demonstrate proficiency with program development software.

10.0 Systems analysis and design. The student will be able to:

10.01 Perform a preliminary investigation of a systems project.
10.02 Perform a detailed systems investigation and analysis of the project.
10.03 Design the input and output for the system.
10.04 Design the data files for the system.
10.05 Design the processing flow of the system.
10.06 Design a system to insure that only valid data is accepted and processed, completely and accurately.
10.07 Establish a project plan for the development and implementation of the system.
10.08 Develop the final systems documentation.
10.09 Conduct necessary training and file conversion to properly implement the system.

11.0 Human resources management activities. The student will be able to:

11.01 Summarize the history of human resource management.
11.02 Describe the importance of human resources.
11.03 Describe the components of the job requirement and analysis process.
11.04 Describe the important elements of effective human resource planning.
11.05 Discuss the performance appraisal and the uses of the performance appraisal.
11.06 Compare various training options available to organizations
11.07 Describe various ways of compensating employees.
11.08 Summarize the legal regulations of compensation systems
11.09 Explain the importance of maintaining employees.
11.10 Discuss the importance of safety and health laws and standards.
11.11 Describe how to create a safe and healthy work environment.
11.12 Describe labor relations and collective bargaining.

12.0 Use various models and strategies for project management. The student will be able to:

12.01 Understand how to control a project.
12.02 Describe effective project closeout procedures.
12.03 Identify the goals of project management.
12.04 Establish effective communication with stakeholders to increase project efficiency.
12.05 Create a project priority matrix to balance priorities.
12.06 Evaluate the critical path to reduce project length.
12.07 Use Planning Processes: Work Breakdown Structure, Risk Management, Estimating, and Scheduling.
12.08 Use Cost Management, Procurement Management, and Project Tracking methods/models/strategies.
12.09 Describe closing processes, Project Closeout, Project Closing Activities, and Project Completion Workshops.

13.0 Customer service techniques. The student will be able to:

13.01 Define customer service.
13.02 Explain the value of customer service
13.03 Discuss solutions to overcoming obstacles in customer service.
13.04 Define service culture in organizations.
13.05 Describe management's role in customer service formulation.
13.06 Describe employee empowerment and its importance in providing good customer service.
13.07 Explain the role of communication in customer service.
13.08 Describe the basic behavioral styles of customers.
13.09 Explain the difference behavioral styles of a challenging customer.
13.10 Describe strategies of dealing with challenging customers
13.11 Determine strategies for working with various customer behaviors.

14.0 Employability Skills. The student will be able to:

14.01 Conduct a job search.
14.02 Secure information about a job.
14.03 List and obtain documents that may be required when applying for a job and preparing for an interview.
14.04 Complete a job application form correctly.
14.05 Demonstrate competence in job interview techniques.
14.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, other employee, or customer.
14.07 Identify and describe acceptable work habits.
14.08 Demonstrate knowledge of how to make appropriate job changes during the course of a career.
14.09 Demonstrate acceptable employee health habits.
14.10 Demonstrate knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

15.0 Communications skills. The student will be able to:

15.01 Write logical and clear statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.

15.02 Read and explain graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
15.03 Read and follow written and oral instructions.
15.04 Answer and ask questions coherently and concisely.
15.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
15.06 Demonstrate appropriate telephone/communication skills
15.07 Conduct oral presentations.
15.08 Observe and interpret verbal and nonverbal behavior.
15.09 Use English language skills in punctuation and grammar.
15.10 Compose and critique business documents, memorandums, business letters, requests, answer requests, claims/adjustments, and letters using correct English grammar and punctuation.
15.11 Communicate through the Internet using e-mail, attachments, net meetings, and video conferencing.
15.12 Summarize the skills involved in being an effective listener.
15.13 Identify barriers to intercultural communication.
15.14 Search the Internet using different search engines.
15.15 Write routine, good and bad news, and goodwill messages.
15.16 Write persuasive messages.
15.17 Communicate information through the Internet and using other electronic devices.
15.18 Find, evaluate and process information.
15.19 Create electronic presentations.
15.20 Create effective business reports and proposals.
15.21 Write professional resumes and complete applications.
15.22 Create effective Web pages.

16.0 Human relations skills. The student will be able to:

16.01 Demonstrate appropriate work habits.
16.02 Identify traits that promote good human relations and increase job performance.
16.03 Analyze and develop written solutions to behavior problems affecting job performance.
16.04 Demonstrate ability to work in multicultural and diverse environments.
16.05 Identify opportunities for business development by employing international relationships and human resources.
16.06 Identify the significant events in the human relations movement in U.S. business history.

17.0 Decision making activities. The student will be able to:

17.01 List the steps in problem solving.
17.02 Identify relevant variables, tasks, actions, and outcomes.
17.03 Demonstrate the ability to determine the appropriate priority and sequence of tasks.
17.04 Prepare a day's schedule for an employer.
17.05 Choose appropriate action in situations requiring following an organization’s chain of command.
17.06 Choose appropriate action in situations requiring effective time management.
17.07 Identify ways to assign, review, and monitor the completion of others’ work.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Enterprise Resource Planning (ERP) Software Specialist**
Career Cluster: **Information Technology**

	AS	AAS
CIP Number	1506.120108	0506.120108
Program Type	College Credit	College Credit
Standard Length	63 credit hours	63 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	11-3021	11-3021
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as an ERP specialist, ERP developer, ERP interface technician, ERP administrator, ERP database specialist, ERP designer, or ERP planner in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to enterprise resource software environments such as SAP, Oracle, PeopleSoft, MAPICS, Great Plains, and others.

Program Structure

This program is a planned sequence of instruction consisting of 63 hours.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Cooperative Training: Cooperative training is appropriate for this program but is not required. Whenever offered, the rules, guidelines, and requirements specified in the Florida Department of Education Cooperative Education Manual apply.

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Program Length

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. The standard length of this program is 63 credit hours according to Rule 6A-14.030, F.A.C.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Demonstrate an understanding of Enterprise Resource Planning (ERP) and Electronic Business fundamentals
02.0 Demonstrate proficiency in developing Electronic Resource Planning (ERP) systems solutions
03.0 Demonstrate proficiency in Enterprise Resource Planning (ERP) technical functional requirements
04.0 Demonstrate proficiency in Enterprise Resource Planning (ERP) project planning
05.0 Demonstrate proficiency in Enterprise Resource Planning (ERP) project coordination
06.0 Demonstrate proficiency in developing Enterprise Resource Planning (ERP) customer business function requirements

07.0 Demonstrate competence in communications with Enterprise Resource Planning (ERP) customers
08.0 Demonstrate proficiency in business and management processes
09.0 Demonstrate proficiency with high-level computer programming languages as related to Enterprise Resource Planning (ERP) software
10.0 Perform general organizational computing workplace competencies
11.0 Demonstrate employability skills
12.0 Demonstrate business communication skills
13.0 Demonstrate professional development skills

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Enterprise Resource Planning (ERP) Software Specialist**
CIP Numbers: **1506.120108 AS, 0506.120108 AAS**
Program Length: **63 credit hours**
SOC Code(s): **11-3021**

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. At the completion of this program, the student will be able to:

01.0 Demonstrate an understanding of enterprise resource planning (ERP) and electronic business fundamentals. The student will be able to:

- 01.01 Identify characteristics of the American enterprise system, electronic business (e-commerce), and ERP systems.
- 01.02 List the types of large-scale business environments that ERP systems support.
- 01.03 Understand ERP terminology.
- 01.04 Describe how ERP uses a collection of software applications to manage the entire organization.
- 01.05 Describe how ERP systems integrate sales, manufacturing, logistics, accounting and other enterprise business functions.
- 01.06 Describe how ERP systems share common database and business analysis tools.
- 01.07 Describe how e-commerce has changed society.
- 01.08 Differentiate between the various e-commerce and ERP business models.
- 01.09 Identify e-commerce market sectors.
- 01.10 List factors that contribute to economic growth and impact supply and demand.
- 01.11 Identify characteristics of different types of business ownership.

02.0 Demonstrate proficiency in developing electronic resource planning (ERP) systems solutions. The student will be able to:

- 02.01 Research available enterprise solutions.
- 02.02 Review evaluations of comparable ERP software programs and vendors.
- 02.03 Compare collected data.
- 02.04 Participate in demonstrations of ERP software programs.
- 02.05 Assess hardware requirements.
- 02.06 Assess software requirements.
- 02.07 Analyze solution integration activities.
- 02.08 Establish benchmarking and sizing criteria.
- 02.09 Assist in identifying overall costs.
- 02.10 Understand the difference and relationship between ERP and Customer Relation Management (CRM) software.
- 02.11 List and compare implementation costs.
- 02.12 List and compare training costs.

03.0 Demonstrate proficiency in enterprise resource planning (ERP) technical functional requirements. The student will be able to:

- 03.01 Demonstrate understanding of issues related to shared data and integrated databases.
- 03.02 Design relational databases.
- 03.03 Develop relational databases.
- 03.04 Utilize database toolset – GUI.
- 03.05 Exhibit working knowledge of query language.
- 03.06 Develop an application that interfaces with a database.
- 03.07 Create simple interfaces for data conversion between sources and systems.
- 03.08 Design and develop interface between ERP modules and systems.
- 03.09 Develop simple programs using ERP development tools.
- 03.10 Create usable reports with writing tools and languages related to applicable ERP systems.
- 03.11 Identify different operating system architectures.
- 03.12 Identify networking protocols' benefits and limitations.
- 03.13 Document technical modifications to programs and systems.
- 03.14 Exhibit proficiency in the concepts of distributed applications.

04.0 Demonstrate proficiency in enterprise resource planning (ERP) project planning. The student will be able to:

- 04.01 Describe project planning fundamentals and concepts.
- 04.02 Identify project stakeholders.
- 04.03 Determine stakeholder needs.
- 04.04 Determine stakeholder training requirements.
- 04.05 Identify potential stakeholder conflicts of interest.
- 04.06 Define the scope of a project.
- 04.07 Create project timelines.
- 04.08 Establish rules of communication between project stakeholders.
- 04.09 Create approval plans.
- 04.10 Create conflict resolution plans.
- 04.11 Define and sequence tasks.
- 04.12 Identify technology-related risks.
- 04.13 Establish project hardware and software dependencies.
- 04.14 Identify and assign project resources and materials.
- 04.15 Budget resources.
- 04.16 Identify training needs.
- 04.17 Document project plan.
- 04.18 Construct an implementation schedule for a large project.

05.0 Demonstrate proficiency in enterprise resource planning (ERP) project coordination. The student will be able to:

- 05.01 Use workflow software tools.
- 05.02 Identify and manage project resources.
- 05.03 Identify and manage project risks.
- 05.04 Collaborate with team members.
- 05.05 Facilitate project changes.
- 05.06 Participate in project implementation activities.

05.07 Perform a detailed project analysis.
05.08 Describe the scale and impact of the project on the organization.
05.09 Identify how business process integration will change the relationships between traditional functional departments within the organization.
05.10 Describe any role re-definement by function within the organization.
05.11 Describe the cost and time parameters of the project an implementation schedule for a large project.

06.0 Demonstrate proficiency in developing enterprise resource planning (ERP) customers' business function requirements. The student will be able to:

06.01 Identify, document, and compile stakeholder requirement.
06.02 Define the scope, objectives, and parameters of the project.
06.03 Interview users and analyze their workflow systems and procedures.
06.04 Identify integration points by department and process
06.05 Describe the function and supporting activities for Joint Application Development (JAD) meeting.
06.06 Describe the overall impact the project will have on the organization.
06.07 Assist in identifying potential problem areas.
06.08 Assist with user training.
06.09 Identify solutions and methods to fulfill requirements.

07.0 Demonstrate competence in communications with enterprise resource planning (ERP) customers. The student will be able to:

07.01 Summarize and document project overview.
07.02 Create ERP design modules.
07.03 Write program test scripts.
07.04 Present design models.
07.05 Coordinate activities and resources with all relevant departments.
07.06 Schedule meetings.
07.07 Create progress reports.
07.08 Prepare boardroom presentations.
07.09 Deliver and explain procedure to stakeholders.
07.10 Act as a training intermediary for stakeholders.
07.11 Identify and define long-term implications of system changes.
07.12 Explain the difference between outsourcing and in-house support.
07.13 Apply effective customer relations.
07.14 Describe techniques for keeping the customer informed.
07.15 Demonstrate proper follow-up techniques.

08.0 Demonstrate proficiency in business and management processes. The student will be able to:

08.01 Identify forms of business and not-for-profit organizations.
08.02 Describe basic functions within the typical business organization.
08.03 Describe various forms of management hierarchies and organizational design.
08.04 Identify the responsibilities and duties of managers by level or function within the organization.
08.05 Contrast the operations and organizational form of small organizations and large enterprises.

08.06 Describe the role of Information Technology in modern business management.
08.07 Explain the interrelationships between business processes including marketing, production, finance, human resources.
08.08 Identify software packages that support the business processes used by large enterprises.
08.09 Describe the general accounting process.
08.10 Interpret and use financial reports, budgets, and basic financial analysis techniques.
08.11 Use productivity software to create spreadsheets, documents, reports, schedules, databases, and Internet communication.
08.12 Describe the role of labor in modern business management.
08.13 Describe the functions of human resource management.
08.14 List the basic components of business contracts.

09.0 Demonstrate proficiency with high-level computer programming languages as related to enterprise resource planning (ERP) software. The student will be able to:

09.01 Describe the programming languages applicable to ERP software.
09.02 Apply structured programming for a high-level program as related to ERP software.
09.03 Write a program in a high-level language as related to ERP software.
09.04 Identify and define associated system level concepts.
09.05 Describe mid-range and mainframe computer environments that support ERP.

10.0 Perform general organizational computing workplace competencies. The student will be able to:

10.01 Follow oral and written instructions.
10.02 Prepare, outline, and deliver a short oral presentation.
10.03 Prepare visual material to support an oral presentation.
10.04 Interpret appropriate information from graphics, maps, or signs.
10.05 Participate in group discussions as a member and as a leader.
10.06 Apply effective time-management skills.
10.07 Demonstrate self-motivation and responsibility to complete an assigned task.
10.08 Identify issues contained within professional codes of conduct.
10.09 Identify software licensing issues.
10.10 Identify privacy issues.
10.11 Identify encryption issues.
10.12 Identify legal liability issues.
10.13 Describe acceptable use policies for computer environment.
10.14 Identify copyright issues.
10.15 Apply principles and techniques for being a productive, contributing member of a team.
10.16 Identify and use acceptable strategies for resolving conflict in the workplace.
10.17 Identify techniques for stress management and prevention of job burnout.

11.0 Demonstrate employability skills. The student will be able to:

11.01 Describe different job search methods, including online and traditional.
11.02 Conduct a job search.
11.03 Identify documents, which may be required when applying for a job interview.
11.04 Complete a job application form correctly.
11.05 Demonstrate competence in job interview techniques.

11.06 Identify acceptable work habits.
11.07 Demonstrate knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

12.0 Demonstrate business communication skills. The student will be able to:

12.01 Accurately fill out forms and create documents commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Use correct grammar in written and oral communication.
12.06 Demonstrate appropriate telephone communication skills.
12.07 Demonstrate appropriate verbal skills.
12.08 Demonstrate appropriate listening skills.
12.09 Demonstrate appropriate business etiquette skills.
12.10 Use and follow ethical standards as related to ERP.

13.0 Demonstrate professional development skills. The student will be able to:

13.01 Identify corporate strategies and policies.
13.02 Build mentor relationships.
13.03 Identify industry trends and developments.
13.04 Continue formal education.
13.05 Network with industry professionals.
13.06 Read industry journals and magazines.
13.07 Attend seminars, workshops, and tradeshows.
13.08 Obtain industry and field certifications as required for career advancement.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Database & E-commerce Security CCC**
Career Cluster: **Information Technology**

CCC	
CIP Number	0506.120111
Program Type	College Credit Certificate (CCC)
Program Length	18 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1071.01, Computer Security Specialists
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the IT Security AS/AAS degree program (0506.120106).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as Database Security Professionals and E-Commerce Security Professionals in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to work in Internet, intranet, extranet, and enterprise environments; installing, configuring, designing, and managing secure database and E-commerce resources.

Program Structure

This program is a planned sequence of instruction consisting of 18 hours.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Demonstrate an understanding of computer hardware.
02.0 Demonstrate an understanding of networked environments, hardware, and software.
03.0 Install and configure secure network systems software and utilities.
04.0 Demonstrate proficiency with Internet structure, organization, and navigation.
05.0 Demonstrate an understanding of network access control systems and methodology.
06.0 Describe cryptography concepts, standards, and applications.
07.0 Perform telecommunications and network security activities.
08.0 Demonstrate an understanding of Database Management Systems.
09.0 Perform administrative tasks related to database security.
10.0 Demonstrate an understanding of E-commerce.
11.0 Perform tasks related to e-commerce security.
12.0 Perform Web site management activities.
13.0 Design and implement physical security measures.
14.0 Perform operations and security management practices.
15.0 Employ applications and systems development security techniques.
16.0 Develop business continuity and disaster recovery plans
17.0 Describe ethical issues, pertinent laws, and how to conduct investigations.
18.0 Perform general organizational computing workplace competencies.
19.0 Perform project planning and management activities.
20.0 Perform documentation and technical reference activities.
21.0 Demonstrate employability skills.
22.0 Demonstrate professional development skills.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Database & E-commerce Security CCC**
CIP Number: **0506.120111**
Program Length: **18 credit hours**
SOC Code(s): **15-1071, Computer Security Specialists**

This certificate program is part of the IT Security AS/AAS degree program (0506.120106). At the completion of this program, the student will be able to:

01.0 Demonstrate an understanding of computer hardware-The student will be able to:

- 01.01 Describe multiple numbering systems used to represent instructions and data, including binary, octal, decimal, and hexadecimal.
- 01.02 Identify the architecture of major hardware platforms.
- 01.03 Describe the functions of major hardware components of a computer system.
- 01.04 Discuss the potential impact of emerging hardware technologies.

02.0 Demonstrate an understanding of networked environments, hardware, and software - The student will be able to:

- 02.01 Discuss fundamental network concepts such as topology, protocols, architecture, and internetworking
- 02.02 Define all layers in the Open Systems Interconnect (OSI) and Transmission Control Protocol/Internetworking Protocol (TCP/IP) network protocol models
- 02.03 Discuss the nature of Internetworking Protocol (IP) addresses and Media Access Control (MAC) addresses, and mapping between protocol addressing schemes
- 02.04 Describe the functions and hardware requirements for current popular network servers for such services as: Domain Name Service (DNS), Dynamic Host Configuration Protocol (DHCP), e-mail, the World Wide Web (WWW), proxy, etc.)
- 02.05 Describe the major functions and hardware requirements of network client hardware components
- 02.07 Describe the major functions of network connectivity hardware, such as hubs, repeaters, bridges, routers, switches, and gateways
- 02.08 Describe the function of network storage devices and other peripherals such as a Redundant Arrays of Inexpensive Disks (RAID) and CD-ROM towers

03.0 Install and configure secure network systems software and utilities-The student will be able to:

- 03.01 Install and configure current leading system software, drivers, and service packs.
- 03.03 Discuss the functions of authentication protocols and Virtual Private Networks (VPNs).
- 03.06 Use system software to perform routine maintenance tasks such as backup, hard drive defragmentation, etc.
- 03.07 Install and configure a secure desktop client operating system.
- 03.08 Describe modifications necessary to an operating system (such as modifying parameters, how to handle conflicting interrupts, etc.) when installing,

configuring, and upgrading typical applications software.

03.09 Install and configure client software for network-based applications such as e-mail, Web browsing, terminal emulation, file transfer, group conferencing, database, etc.

03.10 Install and configure current popular network servers for such services as: Domain Name Service (DNS), Dynamic Host Configuration Protocol (DHCP), e-mail, the World Wide Web (WWW), proxy service, etc.).

04.0 Demonstrate proficiency with Internet structure, organization, and navigation-The student will be able to:

04.01 Describe Internet structure and administration, including such topics as Requests For Comments (RFCs) and the Domain Name System (DNS).

04.02 Describe common Internet services and port numbers.

04.03 Demonstrate the use of internetworking protocols, including: Hypertext Transfer Protocol (HTTP), File Transfer Protocol (FTP), e-mail protocols such as Simple Mail Transfer Protocol (SMTP) and Post Office Protocol (POP3), Telnet, etc.).

04.04 Differentiate between push and pull technologies.

04.05 Demonstrate the use of typical remote access mechanisms such as Telnet.

04.06 Describe the data format and proprietary nature of commonly used Internet file types.

04.07 Demonstrate use of Internet clients and services such as e-mail, Web browsers, search engines, newsgroups, mailing lists, chat rooms, file transfer clients, etc.

05.0 Demonstrate an understanding of network access control systems and methodology-The student will be able to:

05.01 Specify by access control mechanisms what users can do, which resources they can access, and what operations they can perform on a system

05.02 Compare and contrast several access control techniques, including access control lists, discretionary, mandatory, lattice-based, rule-based, and role-based access control

05.03 Administer computer, group, and user accounts

05.04 Manage policies, rights, permissions, and passwords for users and/or groups of users

05.06 Oversee password and PIN selection, management, and control

05.07 Demonstrate an understanding of alternative methods to identification and authentication, including characteristic-based or biometric techniques, tokens, tickets, one-time passwords, and single sign-on techniques

05.08 Implement centralized/remote authentication access controls such as RADIUS and TACACS

05.09 Implement and manage decentralized access controls such as domains and trusts relationships

05.10 Analyze methods of server attack, including brute force, denial of service, spoofing, spamming, sniffers, hackers, and crackers

05.11 Demonstrate an understanding of the different types of intrusions and the different methods of intrusion detection, including data extraction, sampling, recognition and traffic analysis

05.12 Monitor the network using various forms of intrusion detection resources to detect attacks

05.13 Investigate audit trails for signs of network intrusions

05.14 Perform penetration testing to find weaknesses in the access control systems.

06.0 Describe cryptography concepts, standards, and applications-The student will be able to:

06.01 Demonstrate an understanding of the encryption/decryption process.
06.02 Demonstrate an understanding of the basic functions involved in key management including creation, distribution, verification, revocation, destruction, storage, recovery, and life span of keys.
06.03 Utilize various forms of cryptography, digital certificates, and digital signatures to achieve confidentiality, integrity, authentication, and non-repudiation in an enterprise data communications network.
06.04 Discuss the creation and use of digital certificates and digital signatures to provide authentication of users and verification of data integrity in network communications.
06.05 Employ cryptographic algorithms such as DES, RSA, MD5 and DSA.
06.06 Identify the strengths and weaknesses of cryptographic algorithms and the effects of key length.
06.07 Implement current popular key distribution methods including manual, Kerberos™, and Internet Security Association and Key Management Protocol (ISAKMP).
06.08 Utilize application and network-based protocols such as Secure Socket Layer (SSL), Secure HyperText Transfer Protocol (SHTTP), and Internetworking Protocol Security (IPSEC).
06.09 Describe the use of hardware components such as smart cards and tokens.

07.0 Perform telecommunications and network security activities – The student will be able to:

07.01 Utilize protocol layering models such as the Open Systems Interconnection (OSI) model in analyzing network security threats.
07.02 Evaluate the security implications involved with the various physical media types such as fiber optics, twisted pair, and wireless communications.
07.03 Describe security concerns with using certain network topologies such as star, bus, mesh, and ring.
07.05 Employ network monitors and packet sniffers to identify security threats.
07.06 Implement security measures using hardware and software such as firewalls, routers, switches, gateways, and proxies.
07.07 Discuss the security vulnerabilities of the Transmission Control Protocol/Internetworking Protocol (TCP/IP) protocol stack.
07.08 Configure Network Layer security protocols such as Internetworking Protocol Security (IPSEC).
07.09 Configure Transport Layer security protocols such as Secure Socket Layer (SSL).
07.10 Utilize Secure Multipurpose Internet Mail Extensions (S/MIME), Secure Socket Layer (SSL) and other Application Layer security protocols.
07.11 Perform connection verification and authentication using Challenge Handshake Authentication Protocol (CHAP) and Password Authentication Protocol (PAP).
07.13 Implement secure data communication techniques such as Virtual Private Networks (VPNs), tunneling, Network Address Translation (NAT), and transmission logging.
07.14 Develop secure e-mail, facsimile, and voice communication procedures to protect against network attacks such as flooding, eavesdropping, sniffing, spamming,

etc. and describe appropriate countermeasures.
07.15 Employ alarms and signals to alert network security administrators of intrusions.

08.0 Demonstrate an understanding of Database Management Systems-The student will be able to:

08.01 Compare the major types of databases including relational, flat file, distributed and object-oriented databases.
08.02 Describe the concept of relational database concepts including tables, entity-relationships, queries, and normalization.
08.03 Analyze the various components of a database management system.
08.04 Install and configure database server software from leading vendors.
08.06 Demonstrate an understanding of transactions processing and concurrency control.
08.08 Employ techniques to ensure database integrity and security.

09.0 Perform administrative tasks related to database security-The student will be able to:

09.01 Develop database security guidelines.
09.02 Monitor database security systems.
09.03 Manage web database security.
09.04 Verify security compliance.
09.05 Secure backup processes.
09.06 Verify backup processes.

10.0 Demonstrate an understanding of e-commerce-The student will be able to:

10.07 Identify components and procedures necessary to process credit card transactions.

11.0 Perform tasks related to e-commerce security-The student will be able to:

11.01 Manage digital certificates.
11.02 Maintain integrity in transaction storage and reporting systems.
11.03 Protect credit card, personal, banking, and "bill to" and "ship to" information in transaction processes.
11.05 Maintain email security related to e-commerce.
11.07 Assist in evaluating e-commerce platform vulnerabilities.

12.0 Perform Web site management activities-The student will be able to:

12.01 Describe the process of obtaining an Internet domain name and mapping it to an Internet Protocol (IP) address.
12.04 Use current Web server software to create and maintain a secure Web site.
12.05 Use Web site access tracking and analysis tools to evaluate the security of a Web server.

13.0 Design and implement physical security measures-The student will be able to:

13.01 Identify the physical threats to an enterprise’s resources that include the employees, facilities, data, equipment, support systems, media, and supplies

they utilize.

13.02 Diagnose an enterprise's physical vulnerabilities to threats from natural disasters such as fire, flooding, and power loss.
13.03 Specify possible countermeasures to physically protect an enterprise's resources and sensitive information.
13.04 Develop a list of physical facility requirements to secure the premises.
13.05 Evaluate the applicability of technical controls such as smart cards, access logs, and intrusion detection systems.

14.0 Perform operations and security management practices-The student will be able to:

14.01 Perform personnel administrative management operations, including specifying job requirements, background checking, job rotation and termination procedures.
14.02 Implement anti-virus solutions on an enterprise-wide basis.
14.03 Perform backups of critical information.
14.04 Protect the privacy of personal data.
14.05 Demonstrate proper handling including marking, handling, storage and destruction of sensitive information and media
14.06 Demonstrate an understanding of different control types, such as directive, preventive, detective, corrective, and recovery controls.
14.07 Determine what resources, including hardware/software, password files, source code, storage and logs, require protection.
14.08 Compare the advantages and disadvantages of internal versus external audits.
14.09 Perform compliance checks on user adherence to security policies.
14.10 Identify different types of monitoring including event, hardware, and illegal software.
14.11 Utilize monitoring tools and techniques such as trend analysis, traffic analysis and reporting mechanisms.
14.12 Implement countermeasures to defend against threats such as fraud, theft, employee sabotage, espionage, terrorism, and hackers.
14.13 Perform penetration testing activities including sniffing, eavesdropping, dumpster diving, and social engineering.
14.14 Understand principles of risk management and asset valuation.
14.15 Monitor server information for defamatory statements and privacy rights infractions.
14.16 Manage software licenses and enforce compliance within the organization.

15.0 Employ applications and systems development security techniques- The student will be able to:

15.03 Analyze the controls that are included within systems and applications software and those used in the development of agents, applets, software, databases, data warehouses and knowledge-based systems.
15.04 Implement features to ensure data and application integrity, security and availability.
15.06 Analyze local environment application issues including viruses, Trojan horses, logic bombs and worms.
15.08 Develop multilevel security schemes for databases and data warehouses.
15.10 Describe different aspects of application and database security control architectures, including process isolation, hardware segmentation, separation of privilege, layering, abstraction and security kernels.

15.13 Define the various types of computer viruses and malicious code and the roles that hackers, crackers, phreaks, and virus writers play in developing and utilizing malicious code.
15.14 Formulate countermeasures to defend against or detect viruses and malicious code.
15.15 Utilize anti-virus software and develop policies to provide enterprise-wide anti-virus protection.
15.16 Employ countermeasures to defend against attacks such as brute force and replay attacks.

16.0 Develop business continuity and disaster recovery plans-The student will be able to:

16.01 Perform a business impact assessment, including components such as an emergency assessment, specifying business success and critical business functions, establishing priorities, and developing alternative means of accomplishing objectives.
16.02 Specify the necessary capabilities of alternative business sites such as cold, warm, hot and mobile sites to be used in the case of a disaster.
16.03 Develop business continuity, disaster containment, and disaster recovery plans for disasters such as such as floods, fires, power outages, strikes, hardware/software failures, and bombings addressing: protection of physical assets, emergency response, personnel notification, backups and off-site storage, utilities, external communications, and logistics and supplies.

17.0 Describe ethical issues, pertinent laws, and how to conduct investigations-The student will be able to:

17.01 Understand the major categories and types of laws as to how they relate to E-commerce, including criminal law, civil law and administrative law.
17.02 Develop institutional policies and practices to conform to or supplement existing laws regarding data privacy and intellectual property rights.
17.03 Describe abnormal and suspicious activity as it relates to database and e-commerce security.
17.04 Analyze potential data security threats such as fraud or collusion.
17.05 Develop legal institutional policies and practices to protect against purposeful violations of data integrity.
17.06 Identify the major categories of computer crime and attacks, including military, business, financial, terrorist, grudge and “fun” attacks.
17.07 Develop legal institutional policies and practices to conduct an investigation of purposeful violations of data integrity or existing e-commerce laws, including: the collection and preservation of evidence; confiscation of equipment, software and data; interrogation of suspected violators; and reporting of incidents to the appropriate authorities.
17.08 Discuss major ethical and legal issues related to Internet use.

18.0 Perform general organizational computing workplace competencies- The student will be able to:

18.01 Follow oral and written instructions.
18.02 Prepare, outline, and deliver a short oral presentation.
18.05 Interpret appropriate information from graphics, maps, or signs.

18.06 Demonstrate self-motivation and responsibility to complete an assigned task.
18.07 List the steps in problem solving.
18.08 Identify and discuss issues contained within professional codes of conduct.
18.09 Identify and discuss intellectual property rights and licensing issues.
18.10 Identify potential sources of employee/employer or employee/employee conflict and discuss possible approaches to resolve such disagreements.
18.16 Use appropriate communication skills, telephone etiquette, courtesy, and manners when dealing with individuals lacking a technical background.

19.0 Perform project planning and management activities-The student will be able to:

19.01 Apply effective time management skills.
19.04 Describe appropriate measures for planning and implementing corporate-wide upgrade of hardware and software.

20.0 Perform documentation and technical reference activities-The student will be able to:

20.01 Use technical vocabulary appropriately
20.02 Locate information in printed and online technical references
20.03 Prepare documentation to track: physical inventory, regulation and license compliance, hardware and software modifications and upgrades, security breaches and countermeasures, and the current e-commerce security environment

21.0 Demonstrate employability skills-The student will be able to:

21.01 Identify sources of employment opportunities.
21.03 Discuss employee rights regarding privacy, discrimination, due process, safety, etc.

22.0 Demonstrate professional development skills-The student will be able to:

22.04 Anticipate future industry trends.
22.05 Describe options for continuing education.
22.06 Read industry journals and magazines.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Computer Programmer**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507.030100
Program Type	College Credit Certificate (CCC)
Program Length	33 credit hours
CTSO	Phi Beta Lambda & Business Professionals of America (BPA)
SOC Codes (all applicable)	15-1021
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Computer Programming and Analysis AS/AAS degree program (0507.030500).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to analyze business situations and to design, develop and write computer programs; to store, locate, and retrieve specific documents, data, and information; analyze problems using logic/analysis tools, code into computer language; test, monitor, debug, document and maintain computer programs.

More than one programming language should be addressed in this certificate program.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and Business Professionals of America (BPA) are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Perform data file activities.
02.0 Perform analysis activities
03.0 Perform program design activities
04.0 Perform coding activities.
05.0 Perform testing activities
06.0 Perform user-training activities.
07.0 Perform implementation activities.
08.0 Perform user support activities.
09.0 Perform evaluation activities.
10.0 Demonstrate professional development skills.
11.0 Demonstrate general organizational computing workplace competencies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Computer Programmer**
CIP Number: **0507.030100**
Program Length: **33 credit hours**
SOC Code(s): **15-1021**

This certificate program is part of the Computer Programming and Analysis AS/AAS degree program (0507.030500). At the completion of this program, the student will be able to:

01.0 Perform data file activities – The student will be able to:

- 01.01 Select the most efficient method of file organization for a given situation.
- 01.02 Identify security procedures to maintain integrity of files.

02.0 Perform analysis activities – The student will demonstrate proficiency in analysis of information technology systems and be able to:

- 02.01 Communicate with users to ascertain system requirements.
- 02.02 Develop information system requirements to accomplish specific task.
- 02.03 Analyze and document user requirements.
- 02.04 Evaluate alternative~~s~~ solutions.
- 02.05 Analyze and document system requirements.
- 02.06 Create a plan for the design phase of an information technology system.
- 02.07 Develop a timeline for system development.
- 02.08 Communicate the plan.
- 02.09 Develop systems specifications.
- 02.10 Develop systems documentation.
- 02.11 Evaluate system performance.
- 02.12 Demonstrate understanding of technical and operational feasibility issues in determining a system solution.
- 02.13 Demonstrate knowledge, skills, and application of information systems to accomplish specific job objectives.

03.0 Perform program design activities – The student will be able to demonstrate proficiency in design of information technology systems and:

- 03.01 Demonstrate knowledge of computer concepts and terminology
- 03.02 Demonstrate understanding of computer systems architecture including components, networked environments, and operating systems.
- 03.03 Develop design specifications.
- 03.04 Select a feasible development environment.
- 03.05 Validate design specifications.
- 03.06 Document design.
- 03.07 Communicate design specifications
- 03.08 Develop prototype.

04.0 Perform coding activities - The student will be able to demonstrate proficiency in software fundamentals including control and data structures utilizing structured and object-oriented programming methodologies and will be able to:

- 04.01 Identify modules.
- 04.02 Design module.
- 04.03 Code module.
- 04.04 Document module.
- 04.05 Test module.
- 04.06 Debugging code.
- 04.07 Revise module code.
- 04.08 Assemble modules.
- 04.09 Demonstrate proficient use of programming development tools.

05.0 Perform testing activities - The student will be able to:

- 05.01 Develop test plan.
- 05.02 Develop test data.
- 05.03 Validate input(s).
- 05.04 Perform test(s).
- 05.05 Validate expected outcomes.
- 05.06 Determine boundary test cases.
- 05.07 Load-test the system.
- 05.08 Revise program code.
- 05.09 Document results.

06.0 Perform user-training activities - The student will be able to:

- 06.01 Assist in development of user documentation.
- 06.02 Assist in development of training plan.
- 06.03 Demonstrate appropriate user training techniques.

07.0 Perform implementation activities - The student will be able to:

- 07.01 Develop an implementation plan.
- 07.02 Install system.
- 07.03 Validate system.
- 07.04 Troubleshooting methodologies.
- 07.05 Document implementation.

08.0 Perform user-support activities - The student will be able to:

- 08.01 Demonstrate proficient use of productivity software (word processing, spreadsheets, databases, presentation) skills
- 08.02 Demonstrate appropriate communication and interpersonal skills.
- 08.03 Determine the customer needs using system analysis strategies
- 08.04 Listen to the customer and ask appropriate questions
- 08.05 Persist when dealing with difficult customers maintaining a professional demeanor.
- 08.06 Provide suggested information technology solutions using knowledge base
- 08.07 Understand how to research and understand specific corporate culture.

08.08 Use tact when dealing with customer and competitors.
08.09 Maintain professional work ethics and follow policies and procedures
08.10 Respect customer work space/environment.
08.11 Set realistic expectations when establishing deadlines for customer solutions
08.12 Communicate action plan including timelines
08.13 Recognize the existence of internal/external customers and follow appropriate guidelines for each

09.0 Perform evaluation activities - The student will be able to:

09.01 Review software development plans
09.02 Assess validity and performance of software systems.
09.03 Identify improvements to software systems.
09.04 Assist in revisions and enhancements of software systems.
09.05 Assist in project evaluation.
09.06 Recommend improvements.
09.07 Provide feedback to management, users and peer groups.

10.0 Demonstrate professional development skills - The student will be able to:

10.01 Use on-line resources related to employee job requirements
10.02 Understand the importance of continuing development activities such as reading industry journals and magazines; attending trade shows, seminars and other continuing professional development activities; participating in professional organizations and developing professional contacts for future projects.
10.03 Develop insights and skills through structured experimentation
10.04 Anticipate future industry trends.
10.05 Understand the evolving nature of information technology systems and necessity of flexibility and willingness to implement needed changes
10.06 Set career goals/directions.
10.07 Build mentor relationships.

11.0 Demonstrate general organizational computing workplace competencies – The student will be able to:

11.01 Follow oral and written instructions.
11.02 Prepare, outline, and deliver a short oral presentation.
11.03 Participate in analysis, design, coding, implementation and documentation activities as a team member and as a group leader.
11.04 Utilize research skills to obtain appropriate information, graphics, and other data needed.
11.05 Prepare visual material to support an oral presentation.
11.06 Demonstrate self-motivation and responsibility to complete an assigned task.
11.07 List the steps in problem solving.
11.08 Choose appropriate action in situations requiring effective time management.
11.09 Identify and discuss issues contained within professional codes of conduct.
11.10 Identify and discuss software licensing issues.
11.11 Identify and discuss property rights and licensing issues.
11.12 Identify and discuss privacy issues.
11.13 Identify and discuss encryption issues.
11.14 Identify legal liability issues.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Networking Services Technology**
Career Cluster: **Information Technology**

	AS	AAS
CIP Number	1507.030401	0507.030401
Program Type	College Credit	College Credit
Standard Length	63 credit hours	63 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1071	15-1071
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as cabling specialists, PC support technician**,** network control operators, data communications analysts, help desk specialists, network technicians, computer security specialists, network specialists, network managers, network systems analysts, network systems technicians, network troubleshooters, WAN/LAN managers, or systems administrators in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to plan, install, configure, monitor, troubleshoot and manage computer networks in a LAN/WAN environment. Students will be prepared to apply conceptual and theoretical knowledge to the workplace utilizing technical skills learned during the program.

Program Structure

This program is a planned sequence of instruction consisting of 63 hours.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Program Length

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. The standard length of this program is 63 credit hours according to Rule 6A-14.030, F.A.C.

Certificate Programs

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).This AS/AAS degree program includes the following College Credit Certificates:

Information Technology Management (0507.030404) – 30 credit hours
Information Technology Technician (0507.030403) – 21 credit hours
Unix/Linux System Administrator (0507.030406) – 18 credit hours

Standards for the above certificate programs are contained in separate curriculum frameworks.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Demonstrate understanding of networked environments.
02.0 Demonstrate understanding of data communications.
03.0 Understand, install and configure computer hardware.
04.0 Understand, install and configure computer software.
05.0 Understand, install and configure network hardware.
06.0 Understand, install and configure network software.
07.0 Perform internetworking activities.
08.0 Perform network administration and management activities.
09.0 Perform troubleshooting and maintenance activities.
10.0 Perform documentation and technical reference activities.
11.0 Perform user-training activities.
12.0 Demonstrate professional development skills.
13.0 Demonstrate employability skills.
14.0 Perform general organizational computing workplace competencies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Networking Services Technology**
CIP Numbers: **1507.030401 AS, 0507.030401 AAS**
Program Length: **68 credit hours**
SOC Code(s): **15-1071**

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. At the completion of this program, the student will be able to:

01.0 Demonstrate understanding of networked environments – The student will be able to:

- 01.01 Explain the use of binary numbers to represent instructions and data.
- 01.02 Describe the hardware implications of the use of binary representation of instructions and data.
- 01.03 Convert numbers among decimal, binary, and hexadecimal representation.
- 01.04 Perform binary arithmetic.
- 01.05 Identify various coding schemes (ASCII, etc.).
- 01.06 Discuss various data types (signed and unsigned integers, floating point, etc.).
- 01.07 Identify several advantages and disadvantages of networked and non-networked environments.
- 01.08 Describe current network environments, such as peer-to-peer and client/server.
- 01.09 Identify and discuss issues (such as security, privacy, redundancy, etc.) related to networked environments.
- 01.10 Identify and discuss issues related to naming conventions for user ids, email, passwords, and network devices.
- 01.11 List and define layers in the OSI and TCP/IP network protocol models.
- 01.12 Identify and describe current relevant IEEE network standards.
- 01.13 Illustrate typical network topologies.
- 01.14 Identify advantages and disadvantages of each topology.
- 01.15 Describe the major functions of LAN hardware protocols such as Ethernet, token ring, FDDI, and arcnet.
- 01.16 Describe LAN software protocols such as IPX/SPX, TCP/IP, and NetBEUI.
- 01.17 Discuss the nature of IP addresses and MAC addresses, and mapping between protocol addressing schemes.
- 01.18 Identify major emerging technologies (such as ATM, VPN, and voice over IP).
- 01.19 Identify and discuss technical issues related to emerging technologies (such as security, bandwidth capability, and gigabit transmission rates).
- 01.20 Discuss the design and function of a storage-area network (SAN).
- 01.21 Design a LAN, including the specification of architecture, hardware, software, etc.
- 01.22 Identify the advantages of VLANs.
- 01.23 Characterize a VLAN implementation.
- 01.24 Describe the function of a spanning tree algorithm.
- 01.25 Identify a proper network design with a spanning tree component.
- 01.26 Use effectively two different and current network modeling tools.
- 01.27 Produce effective documentation.

02.0 Demonstrate understanding of data communications – The student will be able to:

- 02.01 Differentiate between telecommunications and data communications.
- 02.02 Describe the main functions of each relevant current standard setting organization (IEEE, TIA, etc.).
- 02.03 Compare and contrast digital communications lines and cable characteristics (e.g. ISDN, DSL, T-1 and T-3).
- 02.04 Describe ATM technology; discuss the functions and applications of this technology.
- 02.05 Describe the functioning of modems, their features and operating characteristics.
- 02.06 Define the features of an ASCII terminal.
- 02.07 Describe the function of a UART.
- 02.08 Discuss signal representation and modulation.
- 02.09 Describe current data code systems used in data communication.
- 02.10 Compare and contrast synchronous and asynchronous serial transmission.
- 02.11 Compare and contrast major data communications media in terms of data flow, data codes, and transmission codes.
- 02.12 Define common error detection and correction mechanisms.
- 02.13 Identify LAN access control methods (CSMA/CD, token passing, etc.).
- 02.14 Compare and contrast the major features of the LAN access methods.
- 02.15 Describe asynchronous protocols.
- 02.16 Describe synchronous serial link protocols.
- 02.17 Identify and describe file transfer protocols and methodologies.
- 02.18 Describe data compression methodologies used for file transfer.
- 02.19 Identify evolving issues, such as gigabit transmission requirements, voice over IP, and wireless technologies.

03.0 Understand, install and configure computer hardware – The student will be able to:

- 03.01 Identify and describe distinguishing features of the major hardware platforms.
- 03.02 Describe the functions of major hardware components of a computer system.
- 03.03 Recognize and correctly identify computing hardware components.
- 03.04 Describe emerging hardware technologies and discuss their potential impact.
- 03.05 Implement proper procedures for handling and safeguarding equipment.
- 03.06 Describe procedures for proper disposal of computer components.
- 03.07 Analyze the user's needs
- 03.08 Set up and configure systems and peripherals following institutional protocol.
- 03.09 Set up BIOS.
- 03.10 Install and configure storage and I/O device interfaces.
- 03.11 Install and configure multimedia devices and interfaces.
- 03.12 Install and configure network hardware components.
- 03.13 Design and implement test procedure.
- 03.14 Document systems.
- 03.15 Configure systems and establish baseline.
- 03.16 Design and implement work order procedures.
- 03.17 Design and implement systems backups.

04.0 Understand, install and configure computer software – The student will be able to:

04.01 Describe the functions and major components (BIOS, task management, etc.) of a computer operating system.
04.02 Identify current operating systems and describe their important features.
04.03 Use an operating system for activities such as data and file management.
04.04 Identify current systems utilities and describe their functions.
04.05 Use system software to perform routine maintenance tasks such as backup, hard drive defragmentation, etc.
04.06 Use operating systems of different brands and platforms.
04.07 Use both stand-alone operating systems and network operating systems.
04.08 Create, use, and maintain system configuration files.
04.09 Describe the primary features and functions of the major categories of applications software (word processing, database, spreadsheet, presentation, email, browsers, etc.).
04.10 Use basic features of office productivity software.
04.11 Independently learn to perform (previously untaught) tasks using office productivity software.
04.12 Use software produced by multiple vendors.
04.13 Transmit and exchange data in a multiple vendor software environment.
04.14 Install and configure a microcomputer operating system, system, and application software.
04.15 Describe procedures for uninstalling operating system software.
04.16 Configure software for accessibility by disabled individuals.
04.17 Install and configure applications software upgrades.
04.18 Describe modifications necessary to an operating system (such as modifying parameters, how to handle conflicting interrupts, etc.) when installing, configuring and upgrading typical applications software.
04.19 Install and configure client software for connecting to LANs, WANs, and the Internet (network client, WWW browser, terminal emulation, file transfer, etc.).
04.20 Install and configure client software for client/server and network-based applications (e-mail, videoconferencing, database, etc.).
04.21 Install applications on a server and configure clients for network access.

05.0 Understand, install and configure network hardware – The student will be able to:

05.01 Describe the major functions of network server hardware components.
05.02 Describe the server hardware requirements.
05.03 Describe the hardware needed for hosting a Web site.
05.04 Identify a variety of specialized servers (e.g. proxy, e-mail, DHCP, Web, etc.) and describe the hardware requirements.
05.05 Describe the major functions of network client hardware components.
05.06 Describe client hardware requirements.
05.07 Differentiate between hardware used to implement different topologies such as token ring and Ethernet.
05.08 Recognize and describe current cable technologies such as twisted-pair, coaxial, and fiber optic, and identifying issues associated with plenum versus non-plenum cable plants.
05.09 Describe current wireless technologies such as satellite, microwave, spread spectrum RF, and infrared.
05.10 Identify advantages and disadvantages of wireless and cable technologies.
05.11 Cite appropriate uses of wireless and cable technologies.

05.12 Describe the major functions of network connectivity hardware, such as hubs, repeaters, bridges, routers, switches, and gateways.
05.13 Describe the hardware needed to connect a LAN to the Internet.
05.14 Describe the function of network storage devices and other peripherals (RAID, CD towers, printers, fax machines, scanners, printer/fax/copiers, imaging devices, and document center equipment, etc.).
05.15 Describe the requirements for connecting peripherals directly to a network.
05.16 Set up and configure a server (including installation of NICs and NIC drivers).
05.17 Set up and configure client hardware (including installation of NICs and NIC drivers).
05.18 Set up network storage devices and other peripherals and connect to the network.
05.19 Fabricate patch, crossover and console cables.
05.20 Terminate cable using connectors and punch down panels.
05.21 Pull cable according to cabling plan.
05.22 Test the cable using industry standard measurements.
05.23 Label and document the wiring system.
05.24 Set up a network using cable technology.
05.25 Set up a network using wireless technology.
05.26 Use current connectivity devices such as hubs, repeaters, bridges, routers, switches, and gateways.

06.0 Understand, install and configure network software – The student will be able to:

06.01 Describe the major functions of network server software components.
06.02 Compare and contrast major functions and features of current network operating systems (including directory services).
06.03 Design a directory and security structure.
06.04 Install and configure a LAN server.
06.05 Configure protocol stacks.
06.06 Configure a server for multiple network protocols and frame types.
06.07 Configure a server to handle multiple languages for international applications.
06.08 Set up and configure network routing, using appropriate documentation.
06.09 Describe management issues and procedures for handling multiple servers on a network.
06.10 Install and connect multiple servers (including different platforms).
06.11 Install and configure client-auditing software.
06.12 Install and configure software to build client-side images.
06.13 Describe the major functions of network client software components.
06.14 Install and configure client software on multiple hardware platforms.
06.15 Test and document client software installation.
06.16 Install and configure drivers for NICs and network peripherals (including printers).
06.17 Install and configure client/server applications (such as e-mail, scheduling, etc) on a server.
06.18 Install and configure network-based services such as videoconferencing, integrated voicemail/email/fax, large document storage and retrieval, etc.
06.19 Set up a proxy server and a gateway.
06.20 Set up a server for remote access.
06.21 Document client server application installation and establish baselines.
06.22 Monitor client server application and database.
06.23 Document and enforce software licensing.

07.0 Perform internetworking activities – The student will be able to:

07.01 Describe WAN topologies and MAN topologies.
07.02 Differentiate between WAN topologies and LAN topologies.
07.03 Compare and contrast routing protocols (e.g., RIP, OSFP).
07.04 Describe the general routing problem and common solutions (including routing verses bridging).
07.05 Identify and describe WAN protocols.
07.06 Explain how the first three layers of the OSI model relate to routing and switching.
07.07 Describe various routing protocols such as RIP, OSPF.
07.08 Differentiate among routing, switching and bridging.
07.09 Install routers to simulate a WAN/LAN network.
07.10 Explain each step necessary for connecting a network to the Internet.
07.11 Explain the differences between connecting to the Internet via a dial-up connection vs. a dedicated connection.
07.12 Identify two major network issues associated with each of Internet, intranet, and extranet.
07.13 Implement LAN/WAN connections, including virtual private networks (VPN), permanent virtual circuits (PVC), frame relay, tunneling, remote and mobile user access, etc.
07.14 Define the basic software components of a WAN.
07.15 Configure routers to simulate a WAN/LAN network.
07.16 Explain the function and purpose of firewalls and firebreaks and their purpose.
07.17 Configure access lists to limit traffic and enhance security.
07.18 Explain three major security concerns relating to data communications.

08.0 Perform Network administration and management activities – The student will be able to:

08.01 Create and manage user accounts based on standard criteria including department, application needs, and permissions.
08.02 Establish, document and disseminate user security guidelines.
08.03 Create and test account templates and policies.
08.04 Document account setup
08.05 Grant/deny access to peripherals.
08.06 Grant/deny access to logins.
08.07 Grant/deny access to file systems.
08.08 Perform network monitoring activities to ensure account integrity.
08.09 Establish procedures for termination of user accounts.
08.10 Manage software licensing based on user requirements.
08.11 Document security policies and violations.
08.12 Install and update anti-virus software.
08.13 Describe current encryption standards - public vs. private key, NSA DES, PGP.
08.14 Describe the functions and characteristics of firewalls.
08.15 Address security issues raised by the ability to access server remotely.
08.16 Discuss the functions of authentication servers, RADIUS, and VPN.
08.17 Establish files backup procedures.
08.18 Develop and publish backup schedule.
08.19 Implement back up procedures.
08.20 Design test procedures.

08.21 Test backup by performing restore of sample data.
08.22 Document backup.
08.23 Monitor backup.
08.24 Coordinate off-site storage of backup files.
08.25 Establish a baseline for optimal network performance.
08.26 Capture sample data and compare to baseline.
08.27 Recommend changes to enhance network performance.
08.28 Configure time synchronization and troubleshoot inconsistencies.\
08.29 Use network management tools effectively to integrate and manage network resources.
08.30 Explain RMON and SNMP and their use in monitoring a network.
08.31 Demonstrate the use of a network management package.
08.32 Configure network devices to send SNMP traps or alerts to network management systems.
08.33 Discuss quality-of-service considerations and switching prioritization.
08.34 Describe routing metrics such as hop counts, cost, etc.
08.35 Describe typical WAN links and discuss bandwidth considerations.
08.36 Provide examples of WAN backup techniques such as dial-backup that illustrate when they are appropriate.

09.0 Perform troubleshooting and maintenance activities – The student will be able to:

09.01 Describe the use and features of diagnostic test equipment.*
09.02 Describe effective troubleshooting strategies and techniques to resolve basic hardware, software, and network problems.*
09.03 Recognize and resolve basic hardware and software configuration problems.
09.04 Eliminate the obvious using techniques such as substitution.
09.05 Trace for connectivity issues through each system component.
09.06 Identify resources for troubleshooting including online documentation.
09.07 Follow standard operating procedures for troubleshooting hardware and software.
09.08 Implement restoration of critical resources.
09.09 Determine when to escalate issues based on predefined guidelines.
09.10 Document problems and solutions for future reference.
09.11 Assemble reference manual including frequently asked questions.
09.12 Define windows of opportunity for maintenance tasks.
09.13 Determine type of maintenance programs needed to ensure maximum system performance.
09.14 Determine service intervals and publish maintenance schedule.
09.15 Document maintenance performed.
09.16 Establish a plan of obsolescence.

10.0 Perform documentation and technical reference activities – The student will be able to:

10.01 Describe appropriate documentation procedures and practices.
10.02 Effectively use locally maintained systems, software, and network documentation.
10.03 Produce and maintain system documentation, such as inventory, costs, installed software, and procedures.
10.04 Maintain network documentation, including server and workstation hardware and software specifications.

10.05 Document the router configuration.
10.06 Effectively use several standard visual modeling tools.
10.07 Maintain visual network documentation, such as cabling diagrams.
10.08 Describe effective strategies for online research.
10.09 Locate technical information online.
10.10 Evaluate information located through online research.
10.11 Correctly cite Internet-based resources.

11.0 Perform user-training activities – The student will be able to:

11.01 Instruct user in login procedure.
11.02 Explain downloading procedure and policy.
11.03 Orient user to company LAN and workstation policies.
11.04 Orient user to applications.
11.05 Management and backup procedures.
11.06 Develop an ongoing training program.

12.0 Demonstrate professional development skills – The student will be able to understand the importance of:

12.01 Attending classes, seminars, and workshops.
12.02 Reviewing literature and reading current literature.
12.03 Evaluating skills and taking necessary steps to upgrade.

13.0 Demonstrate Employability Skills – The student will be to:

13.01 Identify appropriate attire and grooming for a business office.
13.02 Identify sources of employment opportunities.
13.03 Discuss employer expectations regarding attendance, punctuality, initiative, teamwork, etc.
13.04 Discuss employee rights regarding privacy, discrimination, due process, safety, etc.
13.05 Explain the importance of having a written job description.
13.06 List representative jobs and career paths for people trained in the computer networking support area.
13.07 List several functions of each representative computer service oriented job and career path.
13.08 Complete employment forms.
13.09 Classify behaviors considered to be appropriate or inappropriate in a job interview situation.
13.10 Compose and type a follow-up letter.
13.11 Compose and type a letter of application and a resume.
13.12 Compose and type a letter of resignation.
13.13 Demonstrate job interview skills.
13.14 Identify methods for securing an employment reference.

14.0 Perform general organizational computing workplace competencies – The student will be able to:

14.01 Follow oral and written instructions.
14.02 Prepare, outline, and deliver a short oral presentation.
14.03 Participate in group discussion as a member and as a leader.
14.04 Obtain appropriate information form graphics, maps, or signs.
14.05 Prepare visual material to support an oral presentation.
14.06 Demonstrate self-motivation and responsibility to complete an assigned task.
14.07 List the steps in problem solving.
14.08 Choose appropriate action in situations requiring effective time management.
14.09 Identify and discuss issues contained within professional codes of conduct.
14.10 Identify and discuss software-licensing issues.
14.11 Identify and discuss property rights and licensing issues.
14.12 Identify and discuss privacy issues.
14.13 Identify and discuss encryption issues.
14.14 Identify legal liability issues.
14.15 Describe appropriate measures for planning and managing a large project.
14.16 Define an implementation schedule for a large project.
14.17 Describe appropriate measures for planning and implementing corporate wide upgrade of hardware and software.
14.18 Identify potential sources of employee/employer or employee/employee conflict and discuss possible approaches to resolve such disagreements.
14.19 Use appropriate communication skills, courtesy, manners, and dress in the workplace.
14.20 Apply principles and techniques for being a productive, contributing member of a team.
14.21 Identify and use acceptable strategies for resolving conflict in the workplace
14.22 Apply principles and techniques for working productively with people of diverse cultures and backgrounds.
14.23 Identify techniques for stress management and prevention of job burn-out.
14.24 Use appropriate communication skills, telephone etiquette, courtesy, and manners when dealing with customers.
14.25 Communicate effectively with individuals lacking a technical background.
14.26 Give clear detailed technical oral instructions.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Information Technology Technician**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507.030403
Program Type	College Credit Certificate (CCC)
Program Length	21 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1041
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Networking Services Technology AS/AAS degree program (0507.030401).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to plan, install, configure, and monitor computer networks in a LAN/WAN environment. Students will be prepared to apply conceptual and theoretical knowledge to the workplace utilizing technical skills learned during the program.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate understanding of networked environments
02.0 Demonstrate understanding of data communications.
03.0 Understand, Install and configure computer hardware.
04.0 Understand, install and configure computer software.
05.0 Understand, install and configure network hardware.
06.0 Understand, install and configure network software.
07.0 Perform internetworking activities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Information Technology Technician**
CIP Number: **0507.030403**
Program Length: **21 Credit Hours**
SOC Code(s): **15-1041**

This certificate program is part of the Networking Services Technology AS/AAS degree program (0507.030401). At the completion of this program, the student will be able to:

01.0 Demonstrate understanding of networked environments – The student will be able to:

- 01.01 Explain the use of binary numbers to represent instructions and data.
- 01.02 Describe the hardware implications of the use of binary representation of instructions and data.
- 01.03 Convert numbers among decimal, binary, and hexadecimal representation.
- 01.04 Perform binary arithmetic.
- 01.05 Identify various coding schemes (ASCII, etc.).
- 01.06 Discuss various data types (signed and unsigned integers, floating point, etc).
- 01.07 Identify several advantages and disadvantages of networked and non-networked environments.
- 01.08 Describe current network environments, such as peer-to-peer and client/server.
- 01.09 Identify and discuss issues (such as security, privacy, redundancy, etc.) related to networked environments.
- 01.10 Identify and discuss issues related to naming conventions for user-ids, e-mail, passwords, and network devices.
- 01.11 List and define layers in the OSI and TCP/IP network protocol models.
- 01.12 Identify and describe current relevant IEEE network standards.
- 01.13 Illustrate typical network topologies.
- 01.14 Identify advantages and disadvantages of each topology.
- 01.15 Describe the major functions of LAN hardware protocols such as Ethernet, token ring, FDDI, and arcnet.
- 01.16 Describe LAN software protocols such as IPX/SPX, TCP/IP, and NetBEUI.
- 01.17 Discuss the nature of IP addresses and MAC addresses, and mapping between protocol addressing schemes.
- 01.18 Identify major emerging technologies (such as ATM, VPN, and voice over IP).
- 01.19 Identify and discuss technical issues related to emerging technologies (such as security, bandwidth capability, and gigabit transmission rates).
- 01.20 Discuss the design and function of a storage-area network (SAN).
- 01.21 Design a LAN, including the specification of architecture, hardware, software, etc.
- 01.22 Identify the advantages of VLANs.
- 01.23 Characterize a VLAN implementation.
- 01.24 Describe the function of a spanning tree algorithm.
- 01.25 Identify a proper network design with a spanning tree component.
- 01.26 Use effectively two different and current network modeling tools.
- 01.27 Produce effective documentation.

02.0 Demonstrate understanding of data communications – The student will be able to:

02.01 Differentiate between telecommunications and data communications.
02.02 Describe the main functions of each relevant current standard setting organization (IEEE, TIA, etc.).
02.03 Compare and contrast digital communications lines and cable characteristics (e.g. ISDN, DSL, T-1 and T-3).
02.04 Describe ATM technology; discuss the functions and applications of this technology.
02.05 Describe the functioning of modems, their features and operating characteristics.
02.06 Define the features of an ASCII terminal.
02.07 Describe the function of a UART.
02.08 Discuss signal representation and modulation.
02.09 Describe current data code systems used in data communication.
02.10 Compare and contrast synchronous and asynchronous serial transmission.
02.11 Compare and contrast major data communications media in terms of data flow, data codes, and codes.
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02.13 Identify LAN access control methods (CSMA/CD, token passing, etc.).
02.14 Compare and contrast the major features of the LAN access methods.
02.15 Describe asynchronous protocols.
02.16 Describe synchronous serial link protocols.
02.17 Identify and describe file transfer protocols and methodologies.
02.18 Describe data compression methodologies used for file transfer.
02.19 Identify evolving issues, such as gigabit transmission requirements, voice over IP, and wireless technologies.

03.0 Understand, Install and configure computer hardware – The student will be able to:

03.01 Identify and describe distinguishing features of the major hardware platforms.
03.02 Describe the functions of major hardware components of a computer system.
03.03 Recognize and correctly identify computing hardware components.
03.04 Describe emerging hardware technologies and discuss their potential impact.
03.05 Implement proper procedures for handling and safeguarding equipment.
03.06 Describe procedures for proper disposal of computer components.
03.07 Analyze the user's needs
03.08 Set up and configure systems and peripherals following institutional protocol.
03.09 Set up BIOS.
03.10 Install and configure storage and I/O device interfaces.
03.11 Install and configure multimedia devices and interfaces.
03.12 Install and configure network hardware components.
03.13 Design and implement test procedure.
03.14 Document systems.
03.15 Configure systems and establish baseline.
03.16 Design and implement work order procedures.
03.17 Design and implement systems backups

04.0 Understand, install and configure computer software- The student will be able to:

04.01 Describe the functions and major components (BIOS, task management, etc.) of a computer operating system.
04.02 Identify current operating systems and describe their important features.
04.03 Use an operating system for activities such as data and file management.

04.04 Identify current systems utilities and describe their functions.
04.05 Use system software to perform routine maintenance tasks such as backup, hard drive defragmentation, etc.
04.06 Use operating systems of different brands and platforms.
04.07 Use both stand-alone operating systems and network operating systems.
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04.10 Use basic features of office productivity software.
04.11 Independently learn to perform (previously untaught) tasks using office productivity software.
04.12 Use software produced by multiple vendors.
04.13 Transmit and exchange data in a multiple vendor software environment.
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04.16 Configure software for accessibility by disabled individuals.
04.17 Install and configure applications software upgrades.
04.18 Describe modifications necessary to an operating system (such as modifying parameters, how to handle conflicting interrupts, etc.) when installing, configuring and upgrading typical applications software.
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04.20 Install and configure client software for client/server and network-based applications (e-mail, videoconferencing, database, etc.).
04.21 Install applications on a server and configure clients for network access.

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05.01 Describe the major functions of network server hardware components.
05.02 Describe server hardware requirements.
05.03 Describe the hardware needed for hosting a Web site.
05.04 Identify a variety of specialized servers (e.g. proxy, e-mail, DHCP, Web, etc.) and describe the hardware requirements.
05.05 Describe the major functions of network client hardware components.
05.06 Describe client hardware requirements.
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05.08 Recognize and describe current cable technologies such as twisted-pair, coaxial, and fiber optic, and identifying issues associated with plenum versus non-plenum cable plants.
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05.14 Pull cable according to cabling plan.
05.15 Test the cable using industry standard measurements.
05.16 Label and document the wiring system.

05.17 Set up a network using cable technology.
05.18 Set up a network using wireless technology.

06.0 Understand, install and configure network software –The student will be able to:

06.01 Describe the major functions of network server software components.
06.02 Compare and contrast major functions and features of current network operating systems (including directory services).
06.03 Design a directory and security structure.
06.04 Install and configure a LAN server.
06.05 Configure protocol stacks.
06.06 Configure a server for multiple network protocols and frame types.
06.07 Configure a server to handle multiple languages for international applications.
06.08 Set up and configure network routing, using appropriate documentation.
06.09 Describe management issues and procedures for handling multiple servers on a network.
06.10 Install and connect multiple servers (including different platforms).
06.11 Install and configure client-auditing software.
06.12 Install and configure software to build client-side images.
06.13 Describe the major functions of network client software components.
06.14 Install and configure client software on multiple hardware platforms.
06.15 Test and document client software installation.
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06.17 Install and configure client/server applications (such as e-mail, scheduling, etc) on a server.
06.18 Install and configure network-based services such as videoconferencing, integrated voicemail/email/fax, large document storage and retrieval, etc.
06.19 Set up a proxy server and a gateway.
06.20 Set up a server for remote access.
06.21 Document client server application installation and establish baselines.
06.22 Monitor client server application and database.
06.23 Document and enforce software licensing.

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07.01 Describe WAN topologies and MAN topologies.
07.02 Differentiate between WAN topologies and LAN topologies.
07.03 Compare and contrast routing protocols (e.g., RIP, OSFP).
07.04 Describe the general routing problem and common solutions (including routing versus bridging).
07.05 Identify and describe WAN protocols.
07.06 Explain how the first three layers of the OSI model relate to routing and switching.
07.07 Describe various routing protocols such as RIP, OSPF.
07.08 Differentiate among routing, switching and bridging.
07.09 Install routers to simulate a WAN/LAN network.
07.10 Explain each step necessary for connecting a network to the Internet.
07.11 Explain the differences between connecting to the Internet via a dial-up connection vs. a dedicated connection.
07.12 Identify two major network issues associated with each of Internet, intranet, and extranet.

07.13 Implement LAN/WAN connections, including virtual private networks (VPN), permanent virtual circuits (PVC), frame relay, tunneling, remote and mobile user access, etc.
07.14 Define the basic software components of a WAN.
07.15 Configure routers to simulate a WAN/LAN network.
07.16 Explain the function and purpose of firewalls and firebreaks and their purpose.
07.17 Configure access lists to limit traffic and enhance security.
07.18 Explain three major security concerns relating to data communications.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Information Technology Management**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507.030404
Program Type	College Credit Certificate (CCC)
Program Length	30 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	11-3021
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Networking Services Technology AS/AAS degree program (0507.030401).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to plan, install, configure, monitor, troubleshoot and manage computer networks in a LAN/WAN environment. Students will be prepared to apply conceptual and theoretical knowledge to the workplace utilizing technical skills learned during the program.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate understanding of networked environments
02.0 Demonstrate understanding of data communications.
03.0 Understand, Install and configure computer hardware.
04.0 Understand, install and configure computer software.
05.0 Understand, install and configure network hardware.
06.0 Understand, install and configure network software.
07.0 Perform internetworking activities.
08.0 Perform network administration and management activities.
09.0 Perform troubleshooting and maintenance activities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Information Technology Management**
CIP Number: **0507.030404**
Program Length: **30 credit hours**
SOC Code(s): **11-3021**

This certificate program is part of the Networking Services Technology AS/AAS degree program (0507.030401). At the completion of this program, the student will be able to:

01.0 Demonstrate understanding of networked environments – The student will be able to:

01.01 Explain the use of binary numbers to represent instructions and data.
01.02 Describe the hardware implications of the use of binary representation of instructions and data.
01.03 Convert numbers among decimal, binary, and hexadecimal representation.
01.04 Perform binary arithmetic.
01.05 Identify various coding schemes (ASCII, etc.).
01.06 Discuss various data types (signed and unsigned integers, floating point, etc).
01.07 Identify several advantages and disadvantages of networked and non-networked environments.
01.08 Describe current network environments, such as peer-to-peer and client/server.
01.09 Identify and discuss issues (such as security, privacy, redundancy, etc.) related to networked environments.
01.10 Identify and discuss issues related to naming conventions for user-ids, e-mail, passwords, and network devices.
01.11 List and define layers in the OSI and TCP/IP network protocol models.
01.12 Identify and describe current relevant IEEE network standards.
01.13 Illustrate typical network topologies.
01.14 Identify advantages and disadvantages of each topology.
01.15 Describe the major functions of LAN hardware protocols such as Ethernet, token ring, FDDI, and arcnet.
01.16 Describe LAN software protocols such as IPX/SPX, TCP/IP, and NetBEUI.
01.17 Discuss the nature of IP addresses and MAC addresses, and mapping between protocol addressing schemes.
01.18 Identify major emerging technologies (such as ATM, VPN, and voice over IP).
01.19 Identify and discuss technical issues related to emerging technologies (such as security, bandwidth capability, and gigabit transmission rates).
01.20 Discuss the design and function of a storage-area network (SAN).
01.21 Design a LAN, including the specification of architecture, hardware, software, etc.
01.22 Identify the advantages of VLANs.
01.23 Characterize a VLAN implementation.
01.24 Describe the function of a spanning tree algorithm.
01.25 Identify a proper network design with a spanning tree component.
01.26 Use effectively two different and current network modeling tools.
01.27 Produce effective documentation.

02.0 Demonstrate understanding of data communications – The student will be able to:

02.01 Differentiate between telecommunications and data communications.
02.02 Describe the main functions of each relevant current standard setting organization (IEEE, TIA, etc.).
02.03 Compare and contrast digital communications lines and cable characteristics (e.g. ISDN, DSL, T-1 and T-3).
02.04 Describe ATM technology; discuss the functions and applications of this technology.
02.05 Describe the functioning of modems, their features and operating characteristics.
02.06 Define the features of an ASCII terminal.
02.07 Describe the function of a UART.
02.08 Discuss signal representation and modulation.
02.09 Describe current data code systems used in data communication.
02.10 Compare and contrast synchronous and asynchronous serial transmission.
02.11 Compare and contrast major data communications media in terms of data flow, data codes, and transmission codes.
02.12 Define common error detection and correction mechanisms.
02.13 Identify LAN access control methods (CSMA/CD, token passing, etc.).
02.14 Compare and contrast the major features of the LAN access methods.
02.15 Describe asynchronous protocols.
02.16 Describe synchronous serial link protocols.
02.17 Identify and describe file transfer protocols and methodologies.
02.18 Describe data compression methodologies used for file transfer.
02.19 Identify evolving issues, such as gigabit transmission requirements, voice over IP, and wireless technologies.

03.0 Understand, install and configure computer hardware – The student will be able to:

03.01 Identify and describe distinguishing features of the major hardware platforms.
03.02 Describe the functions of major hardware components of a computer system.
03.03 Recognize and correctly identify computing hardware components.
03.04 Describe emerging hardware technologies and discuss their potential impact.
03.05 Implement proper procedures for handling and safeguarding equipment.
03.06 Describe procedures for proper disposal of computer components.
03.07 Analyze the user's needs
03.08 Set up and configure systems and peripherals following institutional protocol.
03.09 Set up BIOS.
03.10 Install and configure storage and I/O device interfaces.
03.11 Install and configure multimedia devices and interfaces.
03.12 Install and configure network hardware components.
03.13 Design and implement test procedure.
03.14 Document systems.
03.15 Configure systems and establish baseline.
03.16 Design and implement work order procedures.
03.17 Design and implement systems backups

04.0 Understand, install and configure computer software- The student will be able to:

04.01 Describe the functions and major components (BIOS, task management, etc.) of a computer operating system.
04.02 Identify current operating systems and describe their important features.
04.03 Use an operating system for activities such as data and file management.

04.04 Identify current systems utilities and describe their functions.
04.05 Use system software to perform routine maintenance tasks such as backup, hard drive defragmentation, etc.
04.06 Use operating systems of different brands and platforms.
04.07 Use both stand-alone operating systems and network operating systems.
04.08 Create, use, and maintain system configuration files.
04.09 Describe the primary features and functions of the major categories of applications software (word processing, database, spreadsheet, presentation, e-mail, browsers, etc.).
04.10 Use basic features of office productivity software.
04.11 Independently learn to perform (previously untaught) tasks using office productivity software.
04.12 Use software produced by multiple vendors.
04.13 Transmit and exchange data in a multiple vendor software environment.
04.14 Install and configure a microcomputer operating system, system, and application software.
04.15 Describe procedures for uninstalling operating system software.
04.16 Configure software for accessibility by disabled individuals.
04.17 Install and configure applications software upgrades.
04.18 Describe modifications necessary to an operating system (such as modifying parameters, how to handle conflicting interrupts, etc.) when installing, configuring and upgrading typical applications software.
04.19 Install and configure client software for connecting to LANs, WANs, and the Internet (network client, WWW browser, terminal emulation, file transfer, etc.).
04.20 Install and configure client software for client/server and network-based applications (e-mail, videoconferencing, database, etc.).
04.21 Install applications on a server and configure clients for network access.

05.0 Understand, install and configure network hardware.- The student will be able to:

05.01 Describe the major functions of network server hardware components.
05.02 Describe server hardware requirements.
05.03 Describe the hardware needed for hosting a Web site.
05.04 Identify a variety of specialized servers (e.g. proxy, e-mail, DHCP, Web, etc.) and describe the hardware requirements.
05.05 Describe the major functions of network client hardware components.
05.06 Describe client hardware requirements.
05.07 Differentiate between hardware used to implement different topologies such as token ring and Ethernet.
05.08 Recognize and describe current cable technologies such as twisted-pair, coaxial, and fiber optic, and identifying issues associated with plenum versus non-plenum cable plants.
05.09 Describe current wireless technologies such as satellite, microwave, spread spectrum RF, and infrared.
05.10 Identify advantages and disadvantages of wireless and cable technologies.
05.11 Cite appropriate uses of wireless and cable technologies.
05.12 Fabricate patch, crossover and console cables.
05.13 Terminate cable using connectors and punch down panels.
05.14 Pull cable according to cabling plan.
05.15 Test the cable using industry standard measurements.
05.16 Label and document the wiring system.

05.17 Set up a network using cable technology.
05.18 Set up a network using wireless technology.

06.0 Understand, install and configure network software –The student will be able to:

06.01 Describe the major functions of network server software components.
06.02 Compare and contrast major functions and features of current network operating systems (including directory services).
06.03 Design a directory and security structure.
06.04 Install and configure a LAN server.
06.05 Configure protocol stacks.
06.06 Configure a server for multiple network protocols and frame types.
06.07 Configure a server to handle multiple languages for international applications.
06.08 Set up and configure network routing, using appropriate documentation.
06.09 Describe management issues and procedures for handling multiple servers on a network.
06.10 Install and connect multiple servers (including different platforms).
06.11 Install and configure client-auditing software.
06.12 Install and configure software to build client-side images.
06.13 Describe the major functions of network client software components.
06.14 Install and configure client software on multiple hardware platforms.
06.15 Test and document client software installation.
06.16 Install and configure drivers for NICs and network peripherals (including printers).
06.17 Install and configure client/server applications (such as e-mail, scheduling, etc) on a server.
06.18 Install and configure network-based services such as videoconferencing, integrated voicemail/email/fax, large document storage and retrieval, etc.
06.19 Set up a proxy server and a gateway.
06.20 Set up a server for remote access.
06.21 Document client server application installation and establish baselines.
06.22 Monitor client server application and database.
06.23 Document and enforce software licensing.

07.0 Perform internetworking activities – The student will be able to:

07.01 Describe WAN topologies and MAN topologies.
07.02 Differentiate between WAN topologies and LAN topologies.
07.03 Compare and contrast routing protocols (e.g., RIP, OSFP).
07.04 Describe the general routing problem and common solutions (including routing versus bridging).
07.05 Identify and describe WAN protocols.
07.06 Explain how the first three layers of the OSI model relate to routing and switching.
07.07 Describe various routing protocols such as RIP, OSPF.
07.08 Differentiate among routing, switching and bridging.
07.09 Install routers to simulate a WAN/LAN network.
07.10 Explain each step necessary for connecting a network to the Internet.
07.11 Explain the differences between connecting to the Internet via a dial-up connection vs. a dedicated connection.
07.12 Identify two major network issues associated with each of Internet, intranet, and extranet.

07.13 Implement LAN/WAN connections, including virtual private networks (VPN), permanent virtual circuits (PVC), frame relay, tunneling, remote and mobile user access, etc.
07.14 Define the basic software components of a WAN.
07.15 Configure routers to simulate a WAN/LAN network.
07.16 Explain the function and purpose of firewalls and firebreaks and their purpose.
07.17 Configure access lists to limit traffic and enhance security.
07.18 Explain three major security concerns relating to data communications.

08.0 Perform Network administration and management activities– The student will be able to:

08.01 Create and manage user accounts based on standard criteria including department, application needs, and permissions.
08.02 Establish, document and disseminate user security guidelines.
08.03 Create and test account templates and policies.
08.04 Document account setup
08.05 Grant/deny access to peripherals.
08.06 Grant/deny access to logins.
08.07 Grant/deny access to file systems.
08.08 Perform network monitoring activities to ensure account integrity.
08.09 Establish procedures for termination of user accounts.
08.10 Manage software licensing based on user requirements.
08.11 Document security policies and violations.
08.12 Install and update anti-virus software.
08.13 Describe current encryption standards - public vs. private key, NSA DES, PGP.
08.14 Describe the functions and characteristics of firewalls.
08.15 Address security issues raised by the ability to access server remotely.
08.16 Discuss the functions of authentication servers, RADIUS, and VPN.
08.17 Establish files backup procedures.
08.18 Develop and publish backup schedule.
08.19 Implement back up procedures.
08.20 Design test procedures.
08.21 Test backup by performing restore of sample data.
08.22 Document backup.
08.23 Monitor backup.
08.24 Coordinate off-site storage of backup files.
08.25 Establish a baseline for optimal network performance.
08.26 Capture sample data and compare to baseline.
08.27 Recommend changes to enhance network performance.
08.28 Configure time synchronization and troubleshoot inconsistencies.
08.29 Use network management tools effectively to integrate and manage network resources.
08.30 Explain RMON and SNMP and their use in monitoring a network.
08.31 Demonstrate the use of a network management package.
08.32 Configure network devices to send SNMP traps or alerts to network management systems.
08.33 Discuss quality-of-service considerations and switching prioritization.
08.34 Describe routing metrics such as hop counts, cost, etc.
08.35 Describe typical WAN links and discuss bandwidth considerations.
08.36 Provide examples of WAN backup techniques such as dial-backup that illustrate when they are appropriate.

09.0 Perform troubleshooting and maintenance activities – The student will be able to:

09.01 Describe the use and features of diagnostic test equipment.*
09.02 Describe effective troubleshooting strategies and techniques to resolve basic hardware, software, and network problems.*
09.03 Recognize and resolve basic hardware and software configuration problems.
09.04 Eliminate the obvious using techniques such as substitution.
09.05 Trace for connectivity issues through each system component.
09.06 Identify resources for troubleshooting including online documentation.
09.07 Follow standard operating procedures for troubleshooting hardware and software.
09.08 Implement restoration of critical resources.
09.09 Determine when to escalate issues based on predefined guidelines.
09.10 Document problems and solutions for future reference.
09.11 Assemble reference manual including frequently asked questions.
09.12 Define windows of opportunity for maintenance tasks.
09.13 Determine type of maintenance programs needed to ensure maximum system performance.
09.14 Determine service intervals and publish maintenance schedule.
09.15 Document maintenance performed.
09.16 Establish a plan of obsolescence.

Appendix "A"
Distance Learning Sample Courses with Objective Mapping

The purpose of this appendix is to provide a sample of currently available distance learning products, which can be used to enhance the Computer Networking program. It is not intended to recommend one specific vendor of online curriculum. The decision of which vendor to use should be made based upon familiarity, availability, and cost.

Online Course	Framework Objective
A+ Certification Series	01.0, 02.0, 09.0
A+: Customer Satisfaction	
A+: LANs, WANs, and the Internet	
A+: Navigating DOS and Windows	
A+: Navigating Windows	
A+: PC Technologies	
Windows 2000: Network Infrastructure Implementation	05.0
Windows 2000: Installation & Admin	05.0
Network+ Certification Series	06.0, 03.0, 04.0, 09.0
Microsoft Internet Information Server	07.0
Netware 5.0 Principles of Internetworking	07.0
Microsoft Exchange Server 5.5 Sys Admin	08.0
Windows 2000 for NT Admin	08.0
Windows 2000: Network & OS Basics	08.0
Netware 5.0 Networking Fundamentals	08.0
Netware 5.0: Designing & Implementing NDS	08.0
Netware 5.0: NDS Administration & NT Integration	08.0
Netware 5.0 Service and Support	08.0
Netware 5.0 System Administration	08.0

* Courses from the Element K Computer Professional and Office Productivity Libraries

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Unix/Linux System Administrator**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507.030406
Program Type	College Credit Certificate (CCC)
Program Length	18 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1071
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Networking Services Technology AS/AAS degree program (0507.030401).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to installation of information technology equipment, troubleshooting information technology equipment, and supporting information technology users.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate understanding of networked environments.
02.0 Demonstrate understanding of data communications.
03.0 Understand, install and configure computer hardware.
04.0 Understand, install and configure computer software.
05.0 Understand, install and configure network hardware.
06.0 Understand, install and configure network software.
07.0 Perform internetworking activities.
08.0 Perform network administration and management activities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Unix/Linux System Administrator**
CIP Number: **0507.030406**
Program Length: **18 Credit Hours**
SOC Code(s): **15-1071**

This certificate program is part of the Networking Services Technology AS/AAS degree program (0507.030401). At the completion of this program, the student will be able to:

01.0 Demonstrate understanding of networked environments – The student will be able to:

- 01.01 Explain the use of binary numbers to represent instructions and data.
- 01.02 Describe the hardware implications of the use of binary representation of instructions and data.
- 01.03 Convert numbers among decimal, binary, and hexadecimal representation.
- 01.04 Perform binary arithmetic.
- 01.05 Identify several advantages and disadvantages of networked and non-networked environments.
- 01.06 Describe current network environments, such as peer-to-peer and client/server.
- 01.07 Identify and discuss issues (such as security, privacy, redundancy, etc.) related to networked environments.
- 01.08 Identify and discuss issues related to naming conventions for user ids, email, passwords, and network devices.
- 01.09 List and define layers in the OSI and TCP/IP network protocol models.
- 01.10 Identify and describe current relevant IEEE network standards.
- 01.11 Illustrate typical network topologies.
- 01.12 Identify advantages and disadvantages of each topology.
- 01.13 Describe LAN software protocols such as IPX/SPX, TCP/IP, and NetBEUI.
- 01.14 Discuss the nature of IP addresses and MAC addresses, and mapping between protocol addressing schemes.
- 01.15 Identify major emerging technologies (such as ATM, VPN, and voice over IP).
- 01.16 Identify and discuss technical issues related to emerging technologies (such as security, bandwidth capability, and gigabit transmission rates).
- 01.17 Produce effective documentation.

02.0 Demonstrate understanding of data communications – The student will be able to:

- 02.01 Describe the main functions of each relevant current standard setting organization (IEEE, TIA, etc.).
- 02.02 Identify LAN access control methods (CSMA/CD, token passing, etc.).
- 02.03 Identify and describe file transfer protocols and methodologies.

03.0 Understand, install and configure computer hardware – The student will be able to:

- 03.01 Identify and describe distinguishing features of the major hardware platforms.
- 03.02 Describe the functions of major hardware components of a computer system.
- 03.03 Recognize and correctly identify computing hardware components.
- 03.04 Describe emerging hardware technologies and discuss their potential impact.

03.05 Implement proper procedures for handling and safeguarding equipment.
03.06 Describe procedures for proper disposal of computer components.
03.07 Set up and configure systems and peripherals following institutional protocol.
03.08 Set up BIOS.
03.09 Install and configure storage and I/O device interfaces.
03.10 Install and configure multimedia devices and interfaces.
03.11 Install and configure network hardware components.
03.12 Design and implement test procedure.
03.13 Document systems.
03.14 Configure systems and establish baseline.
03.15 Design and implement work order procedures.
03.16 Design and implement systems backups.

04.0 Understand, install and configure computer software – The student will be able to:

04.01 Describe the functions and major components (BIOS, task management, etc.) of a computer operating system.
04.02 Identify current operating systems and describe their important features.
04.03 Use an operating system for activities such as data and file management.
04.04 Identify current systems utilities and describe their functions.
04.05 Use system software to perform routine maintenance tasks such as backup, hard rive defragmentation, etc.
04.06 Use operating systems of different brands and platforms.
04.07 Create, use, and maintain system configuration files.
04.08 Use software produced by multiple vendors.
04.09 Transmit and exchange data in a multiple vendor software environment.
04.10 Install and configure a microcomputer operating system, system, and application software.
04.11 Describe procedures for uninstalling operating system software.
04.12 Install and configure applications software upgrades.
04.13 Describe modifications necessary to an operating system(such as modifying parameters, how to handle conflicting interrupts, etc.) when installing, configuring and upgrading typical applications software.
04.14 Install and configure client software for connecting to LANs, WANs, and the Internet (network client, WWW browser, terminal emulation, file transfer, etc.).
04.15 Install and configure client software for client/server and network-based applications (e-mail, videoconferencing, database, etc.).
04.16 Install applications on a server and configure clients for network access.

05.0 Understand, install and configure network hardware – The student will be able to:

05.01 Describe the major functions of network server hardware components.
05.02 Describe the server hardware requirements.
05.03 Describe the hardware needed for hosting a Web site.
05.04 Identify a variety of specialized servers (e.g. proxy, e-mail, DHCP, Web, etc.) and describe the hardware requirements.
05.05 Describe the major functions of network client hardware components.
05.06 Describe client hardware requirements.
05.07 Describe the major functions of network connectivity hardware, such as hubs, repeaters, bridges, routers, switches, and gateways.
05.08 Describe the hardware needed to connect a LAN to the Internet.

05.09 Describe the function of network storage devices and other peripherals (RAID, CD towers, printers, fax machines, scanners, printer/fax/copiers, imaging devices, and document center equipment, etc.).
05.10 Describe the requirements for connecting peripherals directly to a network.
05.11 Set up and configure a server (including installation of NICs and NIC drivers).
05.12 Set up and configure client hardware (including installation of NICs and NIC drivers).

06.0 Understand, install and configure network software – The student will be able to:

06.01 Design a directory and security structure.
06.02 Configure protocol stacks.
06.03 Set up and configure network routing, using appropriate documentation.
06.04 Describe management issues and procedures for handling multiple servers on a network.
06.05 Install and connect multiple servers (including different platforms).
06.06 Install and configure drivers for NICs and network peripherals (including printers).
06.07 Install and configure client/server applications (such as e-mail, scheduling, etc) on a server.
06.08 Install and configure network-based services such as videoconferencing, integrated voicemail/email/fax, large document storage and retrieval, etc.
06.09 Set up a proxy server and a gateway.
06.10 Set up a server for remote access.
06.11 Document client server application installation and establish baselines.
06.12 Monitor client server application and database.
06.13 Document and enforce software licensing.

07.0 Perform internetworking activities – The student will be able to:

07.01 Describe WAN topologies and MAN topologies.
07.02 Differentiate between WAN topologies and LAN topologies.0
07.03 Compare and contrast routing protocols (e.g., RIP, OSFP).
07.04 Explain how the first three layers of the OSI model relate to routing and switching.
07.05 Explain each step necessary for connecting a network to the Internet.
07.06 Explain the function and purpose of firewalls and firebreaks and their purpose.
07.07 Configure access lists to limit traffic and enhance security.
07.08 Explain three major security concerns relating to data communications.

08.0 Perform Network administration and management activities – The student will be able to:

08.01 Create and manage user accounts based on standard criteria including department, application needs, and permissions.
08.02 Establish, document and disseminate user security guidelines.
08.03 Create and test account templates and policies.
08.04 Document account setup
08.05 Grant/deny access to peripherals.
08.06 Grant/deny access to logins.
08.07 Grant/deny access to file systems.
08.08 Perform network monitoring activities to ensure account integrity.
08.09 Establish procedures for termination of user accounts.

08.10 Document security policies and violations.
08.11 Describe current encryption standards -public vs. private key, NSA DES, PGP.
08.12 Describe the functions and characteristics of firewalls.
08.13 Address security issues raised by the ability to access server remotely.
08.14 Discuss the functions of authentication servers, RADIUS, and VPN.
08.15 Establish files backup procedures.
08.16 Develop and publish backup schedule.
08.17 Implement back up procedures.
08.18 Test backup by performing restore of sample data.
08.19 Document backup.
08.20 Monitor backup.
08.21 Coordinate off-site storage of backup files.
08.22 Establish a baseline for optimal network performance.
08.23 Configure time synchronization and troubleshoot inconsistencies.
08.24 Use network management tools effectively to integrate and manage network resources.
08.25 Explain RMON and SNMP and their use in monitoring a network.
08.26 Configure network devices to send SNMP traps or alerts to network management systems.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Computer Programming and Analysis**
Career Cluster: **Information Technology**

	AS	AAS
CIP Number	1507.030500	0507.030500
Program Type	College Credit	College Credit
Standard Length	63 credit hours	63 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)	Phi Beta Lambda, BPA(Business Professionals of America)
SOC Codes (all applicable)	15-1021	15-1021
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as entry level programmers, programmer specialists, computer programmers, senior programmers, chief business programmers, programmer analysts, and information systems programmers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content prepares individuals to analyze business situations and to design, develop and write computer programs; to store, locate, and retrieve specific documents, data, and information; analyze problems using logic/analysis tools, code into computer language; test, monitor, debug, document and maintain computer programs.

More than one programming language should be addressed in this degree program.

Program Structure

This program is a planned sequence of instruction consisting of 68 hours.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and Business Professionals of America are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Program Length

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. The standard length of this program is 63 credit hours according to Rule 6A-14.030, F.A.C.

Certificate Programs

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).This AS/AAS degree program includes the following College Credit Certificates:

Computer Programming Specialist (0507.030503) – 18 credit hours
Computer Programmer (0507.030100) – 33 credit hours

Standards for the above certificate programs are contained in separate curriculum frameworks.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Perform data file activities.
02.0 Perform analysis activities
03.0 Perform *p*rogram design activities
04.0 Perform coding activities.
05.0 Perform testing activities
06.0 Perform user-training activities.
07.0 Perform implementation activities.
08.0 Perform user support activities.
09.0 Perform evaluation activities.
10.0 Demonstrate professional development skills.
11.0 Demonstrate employability skills.
12.0 Demonstrate general organizational computing workplace competencies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Computer Programming and Analysis**
CIP Numbers: **1507.030500 AS, 0507.030500 AAS**
Program Length: **63 credit hours**
SOC Code(s): **15-1021**

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. At the completion of this program, the student will be able to:

01.0 Perform data file activities – The student will be able to:

- 01.01 Select the most efficient method of file organization for a given situation.
- 01.02 Identify security procedures to maintain integrity of files.

02.0 Perform analysis activities – The student will demonstrate proficiency in analysis of information technology systems and be able to:

- 02.01 Communicate with users to ascertain system requirements.
- 02.02 Develop information system requirements to accomplish specific task.
- 02.03 Analyze and document user requirements.
- 02.04 Evaluate alternative solutions.
- 02.05 Analyze and document system requirements.
- 02.06 Create a plan for the design phase of an information technology system.
- 02.07 Develop a timeline for system development.
- 02.08 Communicate the plan.
- 02.09 Develop systems specifications.
- 02.10 Develop systems documentation.
- 02.11 Evaluate system performance.
- 02.12 Demonstrate understanding of technical and operational feasibility issues in determining a system solution.
- 02.13 Demonstrate knowledge, skills, and application of information systems to accomplish specific job objectives.

03.0 Perform program design activities – The student will be able to demonstrate proficiency in design of information technology systems and:

- 03.01 Demonstrate knowledge of computer concepts and terminology
- 03.02 Demonstrate understanding of computer systems architecture including components, networked environments, and operating systems.
- 03.03 Develop design specifications.
- 03.04 Select a feasible development environment.
- 03.05 Validate design specifications.
- 03.06 Document design.
- 03.07 Communicate design specifications
- 03.08 Develop prototype.

04.0 Perform coding activities - The student will be able to demonstrate proficiency in software fundamentals including control and data structures utilizing structured and object-oriented programming methodologies and will be able to:

- 04.01 Identify modules.
- 04.02 Design module.
- 04.03 Code module.
- 04.04 Document module.
- 04.05 Test module.
- 04.06 Debugging code.
- 04.07 Revise module code.
- 04.08 Assemble modules.
- 04.09 Demonstrate proficient use of programming development tools.

05.0 Perform testing activities - The student will be able to:

- 05.01 Develop test plan.
- 05.02 Develop test data.
- 05.03 Validate input(s).
- 05.04 Perform test(s).
- 05.05 Validate expected outcomes.
- 05.06 Determine boundary test cases.
- 05.07 Load-test the system.
- 05.08 Revise program code.
- 05.09 Document results.

06.0 Perform user-training activities - The student will be able to:

- 06.01 Assist in development of user documentation.
- 06.02 Assist in development of training plan.
- 06.03 Demonstrate appropriate user training techniques.

07.0 Perform implementation activities - The student will be able to:

- 07.01 Develop an implementation plan.
- 07.02 Install system.
- 07.03 Validate system.
- 07.04 Troubleshooting methodologies.
- 07.05 Document implementation.

08.0 Perform user-support activities - The student will be able to:

- 08.01 Demonstrate proficient use of productivity software (word processing, spreadsheets, databases, presentation) skills
- 08.02 Demonstrate appropriate communication and interpersonal skills.
- 08.03 Determine the customer needs using system analysis strategies.
- 08.04 Listen to the customer and ask appropriate questions
- 08.05 Persist when dealing with difficult customers maintaining a professional demeanor.
- 08.06 Provide suggested information technology solutions using knowledge base
- 08.07 Understand how to research and understand specific corporate culture.

08.08 Use tact when dealing with customer and competitors.
08.09 Maintain professional work ethics and follow policies and procedures
08.10 Respect customer work space/environment.
08.11 Set realistic expectations when establishing deadlines for customer solutions
08.12 Communicate action plan including timelines
08.13 Recognize the existence of internal/external customers and follow appropriate guidelines for each

09.0 Perform evaluation activities - The student will be able to:

09.01 Review software development plans
09.02 Assess validity and performance of software systems.
09.03 Identify improvements to software systems.
09.04 Assist in revisions and enhancements of software systems.
09.05 Assist in project evaluation.
09.06 Recommend improvements.
09.07 Provide feedback to management, users and peer groups.

10.0 Demonstrate professional development skills - The student will be able to:

10.01 Use on-line resources related to employee job requirements
10.02 Understand the importance of continuing development activities such as reading industry journals and magazines; attending trade shows, seminars and other continuing professional development activities; participating in professional organizations and developing professional contacts for future projects.
10.03 Develop insights and skills through structured experimentation
10.04 Anticipate future industry trends.
10.05 Understand the evolving nature of information technology systems and necessity of flexibility and willingness to implement needed changes.
10.06 Set career goals/directions.
10.07 Build mentor relationships.

11.0 Demonstrate employability skills – The student will be able to:

11.01 Demonstrate business communication skills such as producing applications, business letters and memos, and resumes.
11.02 Understand appropriate workplace dress and demeanor for specific corporate cultures.
11.03 List representative jobs and career paths for people trained in the computer programming field.
11.04 List several functions of each representative computer programming job and career path.

12.0 Demonstrate general organizational computing workplace competencies – The student will be able to:

12.01 Follow oral and written instructions.
12.02 Prepare, outline, and deliver a short oral presentation.
12.03 Participate in analysis, design, coding, implementation and documentation activities as a team member and as a group leader.

12.04 Utilize research skills to obtain appropriate information, graphics and other data needed.
12.05 Prepare visual material to support an oral presentation.
12.06 Demonstrate self-motivation and responsibility to complete an activity.
12.07 List the steps in problem solving.
12.08 Choose appropriate action in situations requiring effective time management.
12.09 Identify and discuss issues contained within professional codes of conduct.
12.10 Identify and discuss software licensing issues.
12.11 Identify and discuss property rights and licensing issues.
12.12 Identify and discuss privacy issues.
12.13 Identify and discuss encryption issues.
12.14 Identify legal liability issues.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Computer Programming Specialist**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507.030503
Program Type	College Credit Certificate (CCC)
Program Length	18 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1021
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Computer Programming and Analysis AS/AAS degree program (0507.030500).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to analyze business situations and to design, develop and write computer programs; to store, locate, and retrieve specific documents, data, and information; analyze problems using logic/analysis tools, code into computer language; test, monitor, debug, document and maintain computer programs.

More than one programming language should be addressed in this certificate program.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Perform data file activities.
03.0 Perform program design activities
04.0 Perform coding activities.
05.0 Perform testing activities
07.0 Perform implementation activities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Computer Programming Specialist**
CIP Number: 0507.030503
Program Length: 18 Credit Hours
SOC Code(s): 15-1021

This certificate program is part of the Computer Programming and Analysis AS/AAS degree program (0507.030500). At the completion of this program, the student will be able to:

01.0 Perform data file activities – The student will be able to:

- 01.01 Select the most efficient method of file organization for a given situation.
- 01.02 Identify security procedures to maintain integrity of files.

03.0 Perform program design activities – The student will be able to demonstrate proficiency in design of information technology systems and:

- 03.01 Demonstrate knowledge of computer concepts and terminology
- 03.02 Demonstrate understanding of computer systems architecture including components, networked environments, and operating systems.
- 03.03 Develop design specifications.
- 03.04 Select a feasible development environment.
- 03.05 Validate design specifications.
- 03.06 Document design.
- 03.07 Communicate design specifications
- 03.08 Develop prototype.

04.0 Perform coding activities - The student will be able to demonstrate proficiency in software fundamentals including control and data structures utilizing structured and object-oriented programming methodologies and will be able to:

- 04.01 Identify modules.
- 04.02 Design module.
- 04.03 Code module.
- 04.04 Document module.
- 04.05 Test module.
- 04.06 Debugging code.
- 04.07 Revise module code.
- 04.08 Assemble modules.
- 04.09 Demonstrate proficient use of programming development tools.

05.0 Perform testing activities - The student will be able to:

- 05.01 Develop test plan.
- 05.02 Develop test data.
- 05.03 Validate input(s).
- 05.04 Perform test(s).
- 05.05 Validate expected outcomes.

05.06 Determine boundary test cases.
05.07 Load-test the system.
05.08 Revise program code.
05.09 Document results.

07.0 Perform implementation activities - The student will be able to:

07.01 Develop an implementation plan.
07.02 Install system.
07.03 Validate system.
07.04 Troubleshooting methodologies.
07.05 Document implementation.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Computer Information Technology**
Career Cluster: **Information Technology**

	AS	AAS
CIP Number	1507.030600	0507.030600
Program Type	College Credit	College Credit
Standard Length	63 credit hours	63 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	11-3021	11-3021
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as a PC Support Technician, help desk technician, user support analyst, applications system analyst, information systems specialist, technical support analyst, computer information manager user support supervisor, computer systems analyst, customer service representative, computer operator, computer repair technicians, computer sales person, help desk office supervisor, office systems support specialist, software tester, software trainer, user support specialist in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to analyze microcomputer oriented operating procedures, software applications packages, and hardware in order to devise efficient methods to manage a microcomputer-based work environment; develop new systems to meet projected needs; select and install information technology equipment, troubleshoot information technology equipment, manage and support information technology users.

Program Structure

This program is a planned sequence of instruction consisting of 63 hours.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and Business Professionals of America are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Program Length

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. The standard length of this program is 63 credit hours according to Rule 6A-14.030, F.A.C.

Certificate Programs

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).This AS/AAS degree program includes the following College Credit Certificates:

Information Technology Support Specialist (0507.030606) – 18 credit hours
Information Technology Analysis (0507.030607) – 27 credit hours

Standards for the above certificate programs are contained in separate curriculum frameworks.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Understand, install and configure computer hardware.
02.0 Understand, Install and configure computer software
03.0 Demonstrate understanding of networked environments
04.0 Demonstrate understanding of internet structure, organization and navigation.
05.0 Perform technical system support functions.
06.0 Perform troubleshooting activities.
07.0 Perform systems monitoring activities.
08.0 Perform customer service skills.
09.0 Perform user-training activities.
10.0 Perform computer information systems analysis activities.
11.0 Demonstrate professional development skills.
12.0 Demonstrate employability skills.
13.0 Demonstrate general organization computing workplace competencies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Computer Information Technology**
CIP Numbers: **1507.030600 AS, 0507.030600 AAS**
Program Length: **63 credit hours**
SOC Code(s): **11-3021**

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. At the completion of this program, the student will be able to:

01.0 Understand, install and configure computer hardware. The student will be able to:

- 01.01 Explain the use of binary numbers to represent instructions and data.
- 01.02 Describe the hardware implications of the use of binary representation of instructions and data.
- 01.03 Convert numbers among decimal, binary, and hexadecimal representation.
- 01.04 Perform binary arithmetic.
- 01.05 Identify various coding schemes (ASCII, etc.).
- 01.06 Discuss various data types (signed and unsigned integers, floating point, etc).
- 01.07 Identify the major hardware platforms.
- 01.08 Describe distinguishing features of the major hardware platforms.
- 01.09 Set up and use multiple hardware platforms built on various processor architectures.
- 01.10 Describe the functions of major hardware components of a computer system.
- 01.11 Recognize and correctly identify computing hardware components.
- 01.12 Set up and configure systems and peripherals.
- 01.13 Set up and upgrade BIOS.
- 01.14 Install and configure storage and I/O device interfaces.
- 01.15 Install and configure multimedia devices and interfaces.
- 01.16 Describe emerging hardware technologies and discuss their potential impact.
- 01.17 Implement proper procedures for handling and safeguarding equipment.
- 01.18 Perform preventive maintenance tasks on microcomputer systems.
- 01.19 Describe procedures for proper disposal of computer components.
- 01.20 Review installation specifications
- 01.21 Unpack all components, file and disseminate all inventory and warrant information.
- 01.22 Assure all components are present and functional
- 01.23 Install and configure network hardware components.
- 01.24 Perform component and system level upgrades.
- 01.25 Disassemble and re-assemble a microcomputer system completely.
- 01.26 Describe principles of computer organization as they apply to typical microcomputer equipment.
- 01.27 Draw a schematic of a typical microcomputer system.
- 01.28 Describe the architecture of a typical microcomputer system.
- 01.29 Discuss issues that affect system design and construction (redundancy, fault tolerance, etc.)

02.0 Understand, Install and configure computer software. The student will be able to:

02.01 Describe the functions and major components (BIOS, task management, etc.) of a computer operating system.
02.02 Identify current operating systems and describe their vital features.
02.03 Use an operating system for activities such as data and file management.
02.04 Identify current systems utilities and describe their functions.
02.05 Use system software to perform routine maintenance tasks such as backup, hard drive defragmentation, etc.
02.06 Use operating systems of different brands and platforms.
02.07 Use both stand-alone operating systems and network operating systems.
02.08 Create, use, and maintain system configuration files.
02.09 Make configuration changes to an operating system to optimize performance.
02.10 Transmit and exchange data files in a multiple platform hardware environment.
02.11 Describe the primary features and functions of the major categories of applications software (word processing, database, spreadsheet, presentation, email, browsers, etc.).
02.12 Use basic features of office productivity software.
02.13 Learn independently to perform (previously untaught) tasks using office productivity software.
02.14 Use software produced by multiple vendors.
02.15 Transmit and exchange data in a multiple vendor software environment.
02.16 Use integration features of different office productivity applications software.
02.17 Use office productivity or other applications.
02.18 Install and configure a microcomputer operating system.
02.19 Describe procedures for uninstalling operating system software.
02.20 Install and configure system software.
02.21 Install and configure applications software.
02.22 Configure software for accessibility by disabled individuals.
02.23 Install and configure applications software upgrades.
02.24 Describe modifications necessary to an operating system (such as modifying parameters, how to handle conflicting interrupts, etc.) when installing, configuring and upgrading typical applications software.
02.25 Install and configure client software for connecting to LANs, WANs, and the Internet (network client, WWW browser, terminal emulation, file transfer, etc.).
02.26 Install and configure client software for client/server and network-based applications (e-mail, videoconferencing, database, etc.)
02.27 Install applications on a server and configure clients for network access.
02.28 Install and configure applications software at an advanced level, such as one of the following: Computer-Aided Design (CAD), Geographical Information System (GIS), statistical software, desktop publishing, music editing system or game software.
02.29 Identify several of the most prominent current programming languages.
02.30 Characterize the stages of the system development life cycle.
02.31 Differentiate between two common strategies for problem solving.
02.32 Describe the program design and development process.
02.33 Differentiate between structured programming and object-oriented programming.
02.34 Apply principles of good design and documentation when analyzing programs.
02.35 Name several emerging software technologies.
02.36 Describe the potential impact of the named emerging software technologies.

03.0 Demonstrate understanding of networked environments. The student will be able to:

- 03.01 Identify several advantages and disadvantages of networked and non-network environments.
- 03.02 Describe current network environments, such as peer-to-peer and client/server.
- 03.03 Identify and discuss issues (such as security, privacy, redundancy, etc.) related to networked environments.
- 03.04 Identify and discuss issues related to naming conventions for user-ids, email, passwords, and network devices.
- 03.05 List and define layers in the OSI and TCP/IP network protocol models.
- 03.06 Identify and describe current relevant IEEE network standards.
- 03.07 Illustrate typical network topologies.
- 03.08 Identify advantages and disadvantages of each topology.
- 03.09 Describe the major functions of LAN hardware protocols such as Ethernet, token ring, FDDI, and arcnet.
- 03.10 Describe LAN software protocols such as IPX/SPX, TCP/IP, and NetBEUI.
- 03.11 Discuss the nature of IP addresses and MAC addresses, and mapping between protocol addressing schemes.
- 03.12 Describe the major functions of network server hardware components.
- 03.13 Describe server and client hardware requirements.
- 03.14 Describe the major functions of network client hardware components.
- 03.15 Differentiate between hardware used to implement different topologies such as token ring and Ethernet.
- 03.16 Recognize and describe current cable technologies (such as twisted-pair, coaxial, and fiber optic) and identifying issues associated with plenum versus and non-plenum cable plants.
- 03.17 Describe current wireless technologies such as satellite, microwave, spread spectrum RF, and infrared.
- 03.18 Identify advantages and disadvantages of wireless and cable technologies.
- 03.19 Cite appropriate uses of wireless and cable technologies.
- 03.20 Describe the major functions of network connectivity hardware, such as hubs, repeaters, bridges, routers, switches, and gateways.
- 03.21 Describe the hardware needed to connect a LAN to the Internet.
- 03.22 Describe the function of network storage devices and other peripherals (RAID, CD towers, printers, fax machines, scanners, printer/fax/copiers, imaging devices, and document center equipment, etc.).
- 03.23 Set up and configure a server (including installation of NICs and NIC drivers).
- 03.24 Set up and configure client hardware (including installation of NICs and NIC drivers).
- 03.25 Set up network storage devices and other peripherals and connect to the network.
- 03.26 Describe the major functions of network server software components.
- 03.27 Compare and contrast major functions and features of current network operating systems (including directory services).
- 03.28 Install and configure a LAN server.
- 03.29 Install and configure drivers for NICs and network peripherals.
- 03.30 Configure protocol stacks.
- 03.31 Describe the major functions of network client software components.
- 03.32 Install and configure client software on multiple hardware platforms.
- 03.33 Install and configure drivers for NICs and network peripherals (including printers).
- 03.34 Configure the client to support multiple protocols.

03.35 Differentiate between telecommunications and data communications.
03.36 Compare and contrast digital communications lines and cable characteristics (e.g. ISDN, DSL, T-1 and T-3).

04.0 Demonstrate understanding of internet structure, organization and navigation. The student will be able to:

04.01 Describe the origin, structure, and history of the Internet.
04.02 Describe Internet organization, such as the Internic, domains and requests for comments (RFCs).
04.03 Differentiate between the Internet and the WWW.
04.04 Define Internet push technologies, such as e-mail marketing vs. Web page banner advertising.
04.05 Describe Web e-commerce.
04.06 Differentiate among an Intranet site, an extranet site, and an Internet site.
04.07 Characterize the role of the Internet in today's society.
04.08 Describe several major ethical issues related to Internet use.
04.09 Identify several legal issues related to Internet use.
04.10 Cite several examples to demonstrate how the Internet has affected intellectual property rights.
04.11 Identify several examples to demonstrate how the Internet has affected personal security and privacy.
04.12 Describe the World Wide Web (WWW).
04.13 Cite several examples to show how the WWW has affected our society.
04.14 Demonstrate the use of typical file types and protocols (http:, ftp:, mailto:, gopher:, telnet:, etc.).
04.15 Demonstrate the use of typical remote access mechanisms.
04.16 Describe components of URL and their meanings (including types).
04.17 Use Internet tools effectively and utilities such as e-mail, browsers, search engines, news groups, list serves, chat rooms, file transfers.
04.18 Install and configure an Internet browser.
04.19 Install and configure browser add-ons and plug-ins.
04.20 Describe the Human-Computer Interaction (HCI) factors that impact the design of a Web page and Web site
04.21 Describe and use the process of storyboarding a Web site.
04.22 Describe format, structure and design principles for Web sites.
04.23 Evaluate Web sites using principles of good format, structure, and design.
04.24 List several Web authoring tools in order of complexity of use.
04.25 Describe handicapped-accessibility features for a Web site.
04.26 Evaluate a Web site for handicapped accessibility.

05.0 Perform technical system support functions. The student will be able to:

05.01 Create and follow established procedures and guidelines to manage user accounts.
05.02 Identify network security systems
05.03 Install system and application upgrades and patches as required.
05.04 Create documentation to establish baselines for maintenance and repairs.
05.05 Update documentation including warranty and maintenance agreements.
05.06 Create and perform back-ups following organizational plan.
05.07 Test contingency systems to reduce damage due to disaster

05.08 Perform data recovery as needed.
05.09 Document statistics to identify problems and plans for systems upgrades.

06.0 Perform troubleshooting activities. The student will be able to:

06.01 Describe the use of diagnostic test equipment.
06.02 Describe features of diagnostic software.
06.03 Use system, software, and network documentation.
06.04 Locate and use online documentation resources.
06.05 Describe effective troubleshooting strategies and techniques to resolve basic hardware problems including interviewing and observation.
06.06 Recognize and resolve basic hardware problems.
06.07 Recognize and resolve basic software configuration problems.
06.08 Recognize and resolve system level software conflicts (e.g., IRQ conflicts).
06.09 Recognize and resolve problems originating from software interaction.
06.10 Recognize and resolve problems originating from software/hardware interaction.
06.11 Isolate and replace faulty components (board level only).
06.12 Effectively use appropriate research tools to locate information needed to solve system problems.
06.13 Perform systems troubleshooting tasks on multiple platforms.
06.14 Follow a structured methodology and use effective troubleshooting strategies and techniques to resolve problems with systems, peripheral devices and/or drivers, and network problems.
06.15 Use sniffers, cable testers, and other network troubleshooting tools.
06.16 Use utilities such as ping, telnet, and trace route in testing a network.
06.17 Test WAN links using loop back techniques.
06.18 Identify when to escalate the issue, including determining appropriate entities involved.
06.19 Observe and document results.
06.20 Test the solution to ensure quality.
06.21 Document the final solution.
06.22 Disseminate the solution.
06.23 Follow up with the customer.

07.0 Perform systems monitoring activities. The student will be able to:

07.01 Create and review back up log.
07.02 Create and review server log.
07.03 Create and review application logs.
07.04 Create and review resolution logs.
07.05 Create and review security logs.
07.06 Prepare a schedule to verify applications status.
07.07 Prepare a schedule to verify backup status.
07.08 Prepare a schedule to verify server status.
07.09 Track network performance as compare to an established baseline.
07.10 Identify problem trends and create resolution plans.
07.11 Document statistical analysis and monitoring activities.

08.0 Perform Customer Service Skills – The student will be able to:

08.01 Identify and recognize user's state of mind and attitude.

08.02 Determine the customer needs using system analysis strategies.
08.03 Listen to the customer and ask appropriate questions.
08.04 Maintain a professional demeanor when dealing with difficult customers.
08.05 Provide suggested solutions using knowledge base.
08.06 Project professional appearance and demeanor.
08.07 Promote company services, products, and policies when appropriate.
08.08 Use tact when dealing with customers and competitors.
08.09 Maintain professional work ethics and follow policies and procedures.
08.10 Respect customer work space/environment.
08.11 Relate all information to customer in a manner that the customer can understand.
08.12 Set realistic expectations when establishing deadlines for customer solutions.
08.13 Communicate action plan including timelines.
08.14 Recognize the existence of internal/external customers and follow appropriate guidelines for each.

09.0 Perform User-training Activities – The student will be able to:

09.01 Establish training needs based on systems analysis techniques
09.02 Direct user to appropriate resources based on established needs.
09.03 Demonstrate skill sets expected of the user
09.04 Evaluate user's ability to perform required tasks
09.05 Obtain customer feedback on training
09.06 Provide one-on-one basic training when needed/appropriate
09.07 Explain computer-related corporate user policies
09.08 Demonstrate basic resource usage
09.09 Share relevant knowledge

10.0 Perform Computer Information systems Analysis Activities – The student will be able to:

10.01 Prepare appropriate systems and analysis charts and other visual aids.
10.02 Describe the major steps in the systems development cycle.
10.03 Perform basic business related tasks using the most appropriate software applications.
10.04 Identify situations where software packages and/or custom developed packages need to be integrated with each other.
10.05 Identify situations where software packages and/or hardware need to be integrated with software/hardware available on other types of computers.
10.06 Select appropriate hardware devices to accomplish assigned tasks.
10.07 Identify appropriate vendor sources for software, hardware and auxiliary supplies.

11.0 Demonstrate Professional Development Skills – The student will be able to:

11.01 Identify corporate strategies and policies.
11.02 Maintain professional contact for future projects.
11.03 Build mentor relationships.
11.04 Anticipate future industry trends.
11.05 Continue education.
11.06 Review and analyze other industry productions.
11.07 Use and experiment with the technology.
11.08 Network with local professionals in the industry..

11.09 Read industry journals and magazines.
11.10 Attend seminars, workshops, and tradeshows.

12.0 Demonstrate Employability Skills – The student will be able to:

12.01 Identify appropriate attire and grooming for a business office.
12.02 Identify sources of employment opportunities.
12.03 Discuss employer expectations regarding attendance, punctuality, initiative, teamwork, etc.
12.04 Discuss employee rights regarding privacy, discrimination, due process, safety, etc.
12.05 Explain the importance of having a written job description.
12.06 List several functions of each representative computer service oriented job and career path.
12.07 List several functions of each representative computer service oriented job and career path.
12.08 Complete employment forms.
12.09 Classify behaviors considered to be appropriate or inappropriate in a job interview situation.
12.10 Compose and type a follow-up letter.
12.11 Compose and type a letter of application and a resume.
12.12 Compose and type a letter of resignation.
12.13 Demonstrate job interview skills.
12.14 Identify methods for securing and employment reference.

13.0 Demonstrate general organizational computing workplace competencies – The student will be able to:

13.01 Follow oral and written instructions.
13.02 Prepare, outline, and deliver a short oral presentation.
13.03 Participate in group discussion as a member and as a leader.
13.04 Obtain appropriate information form graphics, maps, or signs.
13.05 Prepare visual material to support an oral presentation.
13.06 Demonstrate self-motivation and responsibility to complete an assigned task.
13.07 List the steps in problem solving.
13.08 Choose appropriate action in situations requiring effective time management.
13.09 Identify and discuss issues contained within professional codes of conduct.
13.10 Identify and discuss software licensing issues.
13.11 Identify and discuss property rights and licensing issues.
13.12 Identify and discuss privacy issues.
13.13 Identify and discuss encryption issues.
13.14 Identify legal liability issues.
13.15 Describe appropriate measures for planning and managing a large project.
13.16 Define an implementation schedule for a large project.
13.17 Describe appropriate measures for planning and implementing corporate wide upgrade of hardware and software.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Database Technology**
Career Cluster: **Information Technology**

	AS	AAS
CIP Number	1507.030601	0507.030601
Program Type	College Credit	College Credit
Standard Length	63 credit hours	63 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1061	15-1061
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as Database Administrators and Developers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

This program focuses on specific, transferable skills and stresses understanding and demonstration of the following elements of the database management and development industry: database creation, database management, database tuning, database software development, and database recovery.

Program Structure

This program is a planned sequence of instruction consisting of 63 hours.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Program Length

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. The standard length of this program is 63 credit hours according to Rule 6A-14.030, F.A.C.

Certificate Programs

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).This AS/AAS degree program includes the following College Credit Certificates:

Microsoft Certified Database Administrator (0507.030604) – 15 credit hours
Microsoft Certified Systems Developer (0507.030605) – 15 credit hours
Oracle Certified Database Administrator (0507.030602) – 15 credit hours
Oracle Certified Database Developer (0507.030603) – 15 credit hours
Oracle Software Engineering (0507.030611) – 33 credit hours
Oracle Certified Administrator (0507.030612) – 33 credit hours

Standards for the above certificate programs are contained in separate curriculum frameworks.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Demonstrate proficiency in developing and operating a database.
02.0 Demonstrate proficiency in manipulating a database and creating tables and data structures.
03.0 Demonstrate proficiency in developing applications and using the procedure builder tool.
04.0 Demonstrate proficiency in creating SQL procedural language blocks of application code that can be shared by multiple forms, reports and data management applications.
05.0 Demonstrate proficiency in creating a complete Forms application using Developer/2000 while working in a graphical user interface (GUI) development environment.
06.0 Demonstrate proficiency in designing multiple forms applications.
07.0 Demonstrate proficiency in developing a variety of standard and custom reports using the reports component of Developer/2000 in a client/server environment.
08.0 Demonstrate proficiency in identifying the Server Physical and Logical architecture.
09.0 Demonstrate proficiency in implementing and planning backup and recovery for the Server.
10.0 Demonstrate proficiency in implementing a Net8 configuration on a workstation and server.
11.0 Demonstrate proficiency in tuning a Server.
12.0 Demonstrate proficiency in implementing Database Security.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Database Technology**
CIP Numbers: **1507.030601 AS, 0507.030601 AAS**
Program Length: **63 credit hours**
SOC Code(s): **15-1061**

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency in developing and operating a database --The student will be able to:

- 01.01 Build a relational database.
- 01.02 Query, display, and format data.
- 01.03 Save, retrieve, and run queries.
- 01.04 Build and format reports.
- 01.05 Group and summarize data.

02.0 Demonstrate proficiency in manipulating a database and creating tables and data structures –The student will be able to:

- 02.01 Insert, update, automatically generate, and delete data.
- 02.02 Control transaction processing.
- 02.03 Create, confirm, modify and remove tables to store data.
- 02.04 Apply business rules to ensure data integrity.
- 02.05 Restrict user access to tables.
- 02.06 Improve query performance.

03.0 Demonstrate proficiency in developing applications and using the procedure builder tool--The student will be able to:

- 03.01 Develop programs in PL/SQL.
- 03.02 Insert and manipulate data with PL/SQL.
- 03.03 Manage and execute program units using the Object Navigator and the PL/SQL Interpreter.
- 03.04 Define and compile procedures using the Program Unit Editor.
- 03.05 Control the execution of a PL/SQL program unit.
- 03.06 Test possible solutions by making changes to variables and procedures at runtime.

04.0 Demonstrate proficiency in creating PL/SQL procedural language blocks of application code that can be shared by multiple forms, reports and data management applications -- The student will be able to:

- 04.01 Nest sub-queries within another SQL procedural language command.
- 04.02 Develop applications using procedural capabilities.

04.03 Insert and manipulate data with SQL procedural language.
04.04 Use the procedure builder tool to develop and debug SQL procedure language code.
04.05 Manage and execute program units using the object navigator and the SQL procedural language interpreter.
04.06 Define environmental requirements for peripherals and media.
04.07 Define and compile procedures using the program unit editor.
04.08 Control the execution of an SQL procedural language program unit.

05.0 Demonstrate proficiency in creating a complete forms application using Developer/2000 while working in a graphical user interface (GUI) development environment-The student will be able to:

05.01 Build a new data block using an existing table specification.
05.02 Save and run a form module from the designer.
05.03 Develop a master/detail form module.
05.04 Identify characteristics of each forms file storage type.
05.05 Create forms containing check boxes, radio groups, containing list items, display items, image items and buttons.
05.06 Start additional forms with the same transaction and session.
05.07 Enhance the default menu.
05.08 Add basic menu items.
05.09 Attach a menu module to a forms module.
05.10 Saving and running a form module from the designer.

06.0 Demonstrate proficiency in designing multiple forms applications--The student will be able to:

06.01 Redefine function keys and determining when key triggers should be used or avoided.
06.02 Cause a form module to respond to mouse movement and mouse button actions.
06.03 Creating trigger code to interact with windows.
06.04 Build robust multiple form transactions.
06.05 Choose between different ways of invoking forms.
06.06 Pass data between forms using parameter lists.
06.07 Control coded events and methods.

07.0 Demonstrate proficiency in developing a variety of standard and custom reports using the reports component of Developer/2000 in a client/server environment-The student will be able to:

07.01 Design and execute a simple report.
07.02 Manage the appearance and display of data in reports with layout objects.
07.03 Customize the display of data in reports.
07.04 Tailor the appearance of simple and advanced business reports.
07.05 Integrating text and graphics in reports.
07.06 Import charts and graphs from the graphics component of Developer/2000.
07.07 Applying the packaged functions and procedures supplied with the reports component of Developer/2000.
07.08 Write queries to retrieve data.
07.09 Manage the structure of data in reports using data objects.

07.10 Determine how to best produce reports by analyzing report structures.
07.11 Filter report information from the database server.
07.12 Implement graphics into reports.
07.13 Build modules in Developer 2000 Reports for use with other Developer/2000 tools.
07.14 Manage module storage and security.
07.15 Build reports in which the end user supplies values at runtime to control report output.

08.0 Demonstrate proficiency in identifying the server physical and logical architecture-The student will be able to:

08.01 Identify and define the Server architecture.
08.02 Identify and utilize the functions and processes of the Server.
08.03 Create a database and construct the base data dictionary.
08.04 Start up and shut down a database and instance.

09.0 Demonstrate proficiency in implementing and backup and recovery planning and backup of a server-The student will be able to:

09.01 Identifying backup and recovery techniques.
09.02 Define architecture implications for backup and recovery.
09.03 Examining various failure scenarios and determining proper recovery strategies.
09.04 Identify methods for restoration and recovery.

10.0 Demonstrate proficiency in implementing a Net8 configuration on the server and workstation-The student will be able to:

10.01 Establishing a connection from the Net8 client and server using connection methods.
10.02 Implement troubleshooting strategies for the Networking environment.
10.03 Explain security features in networking products.
10.04 Identify network problems using log and trace files.
10.05 Set logging and tracing parameters.
10.06 Start and stop the Intelligent Agent using the Listener Control utility.
10.07 Identify the configuration files used to define the intelligent agent.

11.0 Demonstrate proficiency in tuning a server-The student will be able to:

11.01 Explain the nature of Server tuning.
11.02 Outline the tuning methodology.
11.03 List and define available diagnostic tools.
11.04 Running the UTLBSTAT/UTLESTAT utility.
11.05 Exam latch contention.
11.06 Diagnose inappropriate use of the SYSTEM and TEMP tablespaces.
11.07 Ensure that files are distributed to minimize 1/0 contention.

12.0 Demonstrate proficiency in implementing database security-The student will be able to:

12.01 Demonstrate an understanding of essential database security concepts.
12.02 Set up and administer users and groups.

12.03 Use appropriate procedures to secure database resources.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Oracle Certified Database Administrator**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507.030602
Program Type	College Credit Certificate (CCC)
Program Length	15 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1061
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Database Technology AS/AAS degree program (insert CIP number).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to database systems, software, programming and analysis and design of databases.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate proficiency in developing and operating a database.
02.0 Demonstrate proficiency in manipulating a database and creating tables and data structures.
03.0 Demonstrate proficiency in developing applications and using the procedure builder tool.
04.0 Demonstrate proficiency in creating SQL procedural language blocks of application code that can be shared by multiple forms, reports and data management applications.
05.0 Demonstrate proficiency in creating a complete Forms application using Developer/2000 while working in a graphical user interface (GUI) development environment.
06.0 Demonstrate proficiency in designing multiple forms applications.
07.0 Demonstrate proficiency in developing a variety of standard and custom reports using the reports component of Developer/2000 in a client/server environment.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Oracle Certified Database Administrator**
CIP Number: **0507.030602**
Program Length: **15 credit hours**
SOC Code(s): **15-1061**

This certificate program is part of the Database Technology AS/AAS degree program (0507.030601). At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency in developing and operating a database --The student will be able to:

- 01.01 Build a relational database.
- 01.02 Query, display, and format data.
- 01.03 Save, retrieve, and run queries.
- 01.04 Build and format reports.
- 01.05 Group and summarize data.

02.0 Demonstrate proficiency in manipulating a database and creating tables and data structures –The student will be able to:

- 02.01 Insert, update, automatically generate, and delete data.
- 02.02 Control transaction processing.
- 02.03 Create, confirm, modify and remove tables to store data.
- 02.04 Apply business rules to ensure data integrity.
- 02.05 Restrict user access to tables.
- 02.06 Improve query performance.

03.0 Demonstrate proficiency in developing applications and using the procedure builder tool--The student will be able to:

- 03.01 Develop programs in PL/SQL.
- 03.02 Insert and manipulate data with PL/SQL.
- 03.03 Manage and execute program units using the Object Navigator and the PL/SQL Interpreter.
- 03.04 Define and compile procedures using the Program Unit Editor.
- 03.05 Control the execution of a PL/SQL program unit.
- 03.06 Test possible solutions by making changes to variables and procedures at runtime.

04.0 Demonstrate proficiency in creating PL/SQL procedural language blocks of application code that can be shared by multiple forms, reports and data management applications -- The student will be able to:

- 04.01 Nest sub-queries within another SQL procedural language command.
- 04.02 Develop applications using procedural capabilities.
- 04.03 Insert and manipulate data with SQL procedural language.
- 04.04 Use the procedure builder tool to develop and debug SQL procedure language

code.

04.05 Manage and execute program units using the object navigator and the SQL procedural language interpreter.
04.06 Define environmental requirements for peripherals and media.
04.07 Define and compile procedures using the program unit editor.
04.08 Control the execution of an SQL procedural language program unit.

05.0 Demonstrate proficiency in creating a complete forms application using Developer/2000 while working in a graphical user interface (GUI) development environment-The student will be able to:

05.01 Build a new data block using an existing table specification.
05.02 Save and run a form module from the designer.
05.03 Develop a master/detail form module.
05.04 Identify characteristics of each forms file storage type.
05.05 Create forms containing check boxes, radio groups, containing list items, display items, image items and buttons.
05.06 Start additional forms with the same transaction and session.
05.07 Enhance the default menu.
05.08 Add basic menu items.
05.09 Attach a menu module to a forms module.
05.10 Saving and running a form module from the designer.

06.0 Demonstrate proficiency in designing multiple forms applications--The student will be able to:

06.01 Redefine function keys and determining when key triggers should be used or avoided.
06.02 Cause a form module to respond to mouse movement and mouse button actions.
06.03 Creating trigger code to interact with windows.
06.04 Build robust multiple form transactions.
06.05 Choose between different ways of invoking forms.
06.06 Pass data between forms using parameter lists.
06.07 Control coded events and methods.

07.0 Demonstrate proficiency in developing a variety of standard and custom reports using the reports component of Developer/2000 in a client/server environment-The student will be able to:

07.01 Design and execute a simple report.
07.02 Manage the appearance and display of data in reports with layout objects.
07.03 Customize the display of data in reports.
07.04 Tailor the appearance of simple and advanced business reports.
07.05 Integrating text and graphics in reports.
07.06 Import charts and graphs from the graphics component of Developer/2000.
07.07 Applying the packaged functions and procedures supplied with the reports component of Developer/2000.
07.08 Write queries to retrieve data.
07.09 Manage the structure of data in reports using data objects.
07.10 Determine how to best produce reports by analyzing report structures.
07.11 Filter report information from the database server.

07.12 Implement graphics into reports.
07.13 Build modules in Developer 2000 Reports for use with other Developer/2000 tools.
07.14 Manage module storage and security.
07.15 Build reports in which the end user supplies values at runtime to control report output.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Oracle Certified Database Developer**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507.030603
Program Type	College Credit Certificate (CCC)
Program Length	15 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1061
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Database Technology AS/AAS degree program (0507.030601).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to database systems, software, programming and analysis and design of databases.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate proficiency in developing and operating a database.
02.0 Demonstrate proficiency in manipulating a database and creating tables and data structures.
03.0 Demonstrate proficiency in developing applications and using the procedure builder tool.
04.0 Demonstrate proficiency in creating SQL procedural language blocks of application code that can be shared by multiple forms, reports and data management applications.
05.0 Demonstrate proficiency in creating a complete Forms application using Developer/2000 while working in a graphical user interface (GUI) development environment.
06.0 Demonstrate proficiency in designing multiple forms applications.
07.0 Demonstrate proficiency in developing a variety of standard and custom reports using the reports component of Developer/2000 in a client/server environment.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Oracle Certified Database Developer**
CIP Number: **0507.030603**
Program Length: **15 Credit Hours**
SOC Code(s): **15-1061**

This certificate program is part of the Database Technology AS/AAS degree program (0507.030601). At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency in developing and operating a database --The student will be able to:

- 01.01 Build a relational database.
- 01.02 Query, display, and format data.
- 01.03 Save, retrieve, and run queries.
- 01.04 Build and format reports.
- 01.05 Group and summarize data.

02.0 Demonstrate proficiency in manipulating a database and creating tables and data structures –The student will be able to:

- 02.01 Insert, update, automatically generate, and delete data.
- 02.02 Control transaction processing.
- 02.03 Create, confirm, modify and remove tables to store data.
- 02.04 Apply business rules to ensure data integrity.
- 02.05 Restrict user access to tables.
- 02.06 Improve query performance.

03.0 Demonstrate proficiency in developing applications and using the procedure builder tool--The student will be able to:

- 03.01 Develop programs in PL/SQL.
- 03.02 Insert and manipulate data with PL/SQL.
- 03.03 Manage and execute program units using the Object Navigator and the PL/SQL Interpreter.
- 03.04 Define and compile procedures using the Program Unit Editor.
- 03.05 Control the execution of a PL/SQL program unit.
- 03.06 Test possible solutions by making changes to variables and procedures at runtime.

04.0 Demonstrate proficiency in creating PL/SQL procedural language blocks of application code that can be shared by multiple forms, reports and data management applications -- The student will be able to:

- 04.01 Nest sub-queries within another SQL procedural language command.
- 04.02 Develop applications using procedural capabilities.
- 04.03 Insert and manipulate data with SQL procedural language.
- 04.04 Use the procedure builder tool to develop and debug SQL procedure language

code.

04.05 Manage and execute program units using the object navigator and the SQL procedural language interpreter.
04.06 Define environmental requirements for peripherals and media.
04.07 Define and compile procedures using the program unit editor.
04.08 Control the execution of an SQL procedural language program unit.

05.0 Demonstrate proficiency in creating a complete forms application using Developer/2000 while working in a graphical user interface (GUI) development environment-The student will be able to:

05.01 Build a new data block using an existing table specification.
05.02 Save and run a form module from the designer.
05.03 Develop a master/detail form module.
05.04 Identify characteristics of each forms file storage type.
05.05 Create forms containing check boxes, radio groups, containing list items, display items, image items and buttons.
05.06 Start additional forms with the same transaction and session.
05.07 Enhance the default menu.
05.08 Add basic menu items.
05.09 Attach a menu module to a forms module.
05.10 Saving and running a form module from the designer.

06.0 Demonstrate proficiency in designing multiple forms applications--The student will be able to:

06.01 Redefine function keys and determining when key triggers should be used or avoided.
06.02 Cause a form module to respond to mouse movement and mouse button actions.
06.03 Creating trigger code to interact with windows.
06.04 Build robust multiple form transactions.
06.05 Choose between different ways of invoking forms.
06.06 Pass data between forms using parameter lists.
06.07 Control coded events and methods.

07.0 Demonstrate proficiency in developing a variety of standard and custom reports using the reports component of Developer/2000 in a client/server environment-The student will be able to:

07.01 Design and execute a simple report.
07.02 Manage the appearance and display of data in reports with layout objects.
07.03 Customize the display of data in reports.
07.04 Tailor the appearance of simple and advanced business reports.
07.05 Integrating text and graphics in reports.
07.06 Import charts and graphs from the graphics component of Developer/2000.
07.07 Applying the packaged functions and procedures supplied with the reports component of Developer/2000.
07.08 Write queries to retrieve data.
07.09 Manage the structure of data in reports using data objects.
07.10 Determine how to best produce reports by analyzing report structures.
07.11 Filter report information from the database server.

07.12 Implement graphics into reports.
07.13 Build modules in Developer 2000 Reports for use with other Developer/2000 tools.
07.14 Manage module storage and security.
07.15 Build reports in which the end user supplies values at runtime to control report output.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Microsoft Certified Database Administrator Certificate**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507.030604
Program Type	College Credit Certificate (CCC)
Program Length	15 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1061
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Database Technology AS/AAS degree program (0507.030601).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to database systems, software, programming and analysis and design of databases.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate proficiency in developing and operating a database.
02.0 Demonstrate proficiency in manipulating a database and creating tables and data structures.
03.0 Demonstrate proficiency in developing applications and using the procedure builder tool.
04.0 Demonstrate proficiency in creating SQL procedural language blocks of application code that can be shared by multiple forms, reports and data management applications.
05.0 Demonstrate proficiency in creating a complete Forms application using Developer/2000 while working in a graphical user interface(GUI) development environment.
06.0 Demonstrate proficiency in designing multiple forms applications.
07.0 Demonstrate proficiency in developing a variety of standard and custom reports using the reports component of Developer/2000 in a client/server environment.
08.0 Demonstrate proficiency in identifying the Server Physical and Logical architecture.
09.0 Demonstrate proficiency in implementing and planning backup and recovery for the Server.
10.0 Demonstrate proficiency in implementing a Net8 configuration on a workstation and server.
11.0 Demonstrate proficiency in tuning a Server.
12.0 Demonstrate proficiency in implementing Database Security.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Microsoft Certified Database Administrator Certificate**
CIP Number: **0507.030604**
Program Length: **15 credit hours**
SOC Code(s): **15-1061**

This certificate program is part of the Database Technology AS/AAS degree program (0507.030601). At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency in developing and operating a database --The student will be able to:

- 01.01 Build a relational database.
- 01.02 Query, display, and format data.
- 01.03 Save, retrieve, and run queries.
- 01.04 Build and format reports.
- 01.05 Group and summarize data.

02.0 Demonstrate proficiency in manipulating a database and creating tables and data structures –The student will be able to:

- 02.01 Insert, update, automatically generate, and delete data.
- 02.02 Control transaction processing.
- 02.03 Create, confirm, modify and remove tables to store data.
- 02.04 Apply business rules to ensure data integrity.
- 02.05 Restrict user access to tables.
- 02.06 Improve query performance.

03.0 Demonstrate proficiency in developing applications and using the procedure builder tool --The student will be able to:

- 03.01 Develop programs in PL/SQL.
- 03.02 Insert and manipulate data with PL/SQL.
- 03.03 Manage and execute program units using the Object Navigator and the PL/SQL Interpreter.
- 03.04 Define and compile procedures using the Program Unit Editor.
- 03.05 Control the execution of a PL/SQL program unit.
- 03.06 Test possible solutions by making changes to variables and procedures at runtime.

04.0 Demonstrate proficiency in creating PL/SQL procedural language blocks of application code that can be shared by multiple forms, reports and data management applications -- The student will be able to:

- 04.01 Nest sub-queries within another SQL procedural language command.
- 04.02 Develop applications using procedural capabilities.
- 04.03 Insert and manipulate data with SQL procedural language.
- 04.04 Use the procedure builder tool to develop and debug SQL procedure language

code.

04.05 Manage and execute program units using the object navigator and the SQL procedural language interpreter.
04.06 Define environmental requirements for peripherals and media.
04.07 Define and compile procedures using the program unit editor.
04.08 Control the execution of an SQL procedural language program unit.

05.0 Demonstrate proficiency in creating a complete forms application using developer/ 2000 while working in a graphical user interface (GUI) development environment--The student will be able to:

05.01 Build a new data block using an existing table specification.
05.02 Save and run a form module from the designer.
05.03 Develop a master/detail form module.
05.04 Identify characteristics of each forms file storage type.
05.05 Create forms containing check boxes, radio groups, containing list items, display items, image items and buttons.
05.06 Start additional forms with the same transaction and session.
05.07 Enhance the default menu.
05.08 Add basic menu items.
05.09 Attach a menu module to a forms module.
05.10 Saving and running a form module from the designer.

06.0 Demonstrate proficiency in designing multiple forms applications --The student will be able to:

06.01 Redefine function keys and determining when key triggers should be used or avoided.
06.02 Cause a form module to respond to mouse movement and mouse button actions.
06.03 Creating trigger code to interact with windows.
06.04 Build robust multiple form transactions.
06.05 Choose between different ways of invoking forms.
06.06 Pass data between forms using parameter lists.
06.07 Control coded events and methods.

07.0 Demonstrate proficiency in developing a variety of standard and custom reports using the reports component of developer/2000 in a client / server environment --The student will be able to:

07.01 Design and execute a simple report.
07.02 Manage the appearance and display of data in reports with layout objects.
07.03 Customize the display of data in reports.
07.04 Tailor the appearance of simple and advanced business reports.
07.05 Integrating text and graphics in reports.
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07.06.01 Developer/2000.
07.07 Applying the packaged functions and procedures supplied with the reports component of Developer/2000.
07.08 Write queries to retrieve data.
07.09 Manage the structure of data in reports using data objects.
07.10 Determine how to best produce reports by analyzing report structures.

07.11 Filter report information from the database server.
07.12 Implement graphics into reports.
07.13 Build modules in Developer 2000 Reports for use with other
07.13.01 Developer/2000 tools.
07.14 Manage module storage and security.
07.15 Build reports in which the end user supplies values at runtime to control report output.

08.0 Demonstrate proficiency in identifying the server physical and logical architecture --The student will be able to:

08.01 Identify and define the Server architecture.
08.02 08.02 Identify and utilize the functions and processes of the Server.
08.03 Create a database and construct the base data dictionary.
08.04 Start up and shut down a database and instance.

09.0 Demonstrate proficiency in implementing and backup and recovery planning and backup of a server --The student will be able to:

09.01 Identifying backup and recovery techniques.
09.02 Define architecture implications for backup and recovery.
09.03 09.03 Examining various failure scenarios and determining proper recovery strategies.
09.04 Identify methods for restoration and recovery.

10.0 Demonstrate proficiency in implementing a Net8 configuration on the server and workstation --The student will be able to:

10.01 Establishing a connection from the Net8 client and server using connection methods.
10.02 Implement troubleshooting strategies for the Networking environment.
10.03 Explain security features in Networking products.
10.04 Identify network problems using log and trace files.
10.05 Set logging and tracing parameters.
10.06 Start and stop the Intelligent Agent using the Listener Control utility.
10.07 Identify the configuration files used to define the intelligent agent.

11.0 Demonstrate proficiency in tuning a server --The student will be able to:

11.01 Explain the nature of Server tuning.
11.02 Outline the tuning methodology.
11.03 List and define available diagnostic tools.
11.04 Running the UTLBSTAT/UTLESTAT utility.
11.05 Exam latch contention.
11.06 Diagnose inappropriate use of the SYSTEM and TEMP tablespaces.
11.07 Ensure that files are distributed to minimize 1/0 contention.

12.0 Demonstrate proficiency in implementing database security --The student will be able to:

12.01 Demonstrate an understanding of essential database security concepts.
12.02 Set up and administer users and groups.

12.03 Use appropriate procedures to secure database resources.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Microsoft Certified Systems Developer**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507.030605
Program Type	College Credit Certificate (CCC)
Program Length	15 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1061
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Database Technology AS/AAS degree program (0507.030601).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to database systems, software, programming and analysis and design of databases.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

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Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate proficiency in developing and operating a database.
02.0 Demonstrate proficiency in manipulating a database and creating tables and data structures.
03.0 Demonstrate proficiency in developing applications and using the procedure builder tool.
04.0 Demonstrate proficiency in creating SQL procedural language blocks of application code that can be shared by multiple forms, reports and data management applications.
05.0 Demonstrate proficiency in creating a complete Forms application using Developer/2000 while working in a graphical user interface (GUI) development environment.
06.0 Demonstrate proficiency in designing multiple forms applications.
08.0 Demonstrate proficiency in identifying the Server Physical and Logical architecture.
09.0 Demonstrate proficiency in implementing and planning backup and recovery for the Server.
10.0 Demonstrate proficiency in implementing a Net8 configuration on a workstation and server.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Microsoft Certified Systems Developer**
CIP Number: **0507.030605**
Program Length: **15 credit hours**
SOC Code(s):

This certificate program is part of the Database Technology AS/AAS degree program (0507.030601). At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency in developing and operating a database --The student will be able to:

- 01.01 Build a relational database.
- 01.02 Query, display, and format data.
- 01.03 Save, retrieve, and run queries.
- 01.04 Build and format reports
- 01.05 Group and summarize data.

02.0 Demonstrate proficiency in manipulating a database and creating tables and data structures –The student will be able to:

- 02.01 Insert, update, automatically generate, and delete data.
- 02.02 Control transaction processing.
- 02.03 Create, confirm, modify and remove tables to store data.
- 02.04 Apply business rules to ensure data integrity.
- 02.05 Restrict user access to tables.
- 02.06 Improve query performance.

03.0 Demonstrate proficiency in developing applications and using the procedure builder tool--The student will be able to:

- 03.01 Develop programs in PL/SQL.
- 03.02 Insert and manipulate data with PL/SQL.
- 03.03 Manage and execute program units using the Object Navigator and the PL/SQL Interpreter.
- 03.04 Define and compile procedures using the Program Unit Editor.
- 03.05 Control the execution of a PL/SQL program unit.
- 03.06 Test possible solutions by making changes to variables and procedures at runtime.

04.0 Demonstrate proficiency in creating PL/SQL procedural language blocks of application code that can be shared by multiple forms, reports and data management applications -- The student will be able to:

- 04.01 Nest sub-queries within another SQL procedural language command.
- 04.02 Develop applications using procedural capabilities.
- 04.03 Insert and manipulate data with SQL procedural language.
- 04.04 Use the procedure builder tool to develop and debug SQL procedure language

code.

04.05 Manage and execute program units using the object navigator and the SQL procedural language interpreter.
04.06 Define environmental requirements for peripherals and media.
04.07 Define and compile procedures using the program unit editor.
04.08 Control the execution of an SQL procedural language program unit.

05.0 Demonstrate proficiency in creating a complete forms application using Developer/2000 while working in a graphical user interface (GUI) development environment-The student will be able to:

05.01 Build a new data block using an existing table specification.
05.02 Save and run a form module from the designer.
05.03 Develop a master/detail form module.
05.04 Identify characteristics of each forms file storage type.
05.05 Create forms containing check boxes, radio groups, containing list items, display items, image items and buttons.
05.06 Start additional forms with the same transaction and session.
05.07 Enhance the default menu.
05.08 Add basic menu items.
05.09 Attach a menu module to a forms module.
05.10 Saving and running a form module from the designer.

06.0 Demonstrate proficiency in designing multiple forms applications--The student will be able to:

06.01 Redefine function keys and determining when key triggers should be used or avoided.
06.02 Cause a form module to respond to mouse movement and mouse button actions.
06.03 Creating trigger code to interact with windows.
06.04 Build robust multiple form transactions.
06.05 Choose between different ways of invoking forms.
06.06 Pass data between forms using parameter lists.
06.07 Control coded events and methods.

08.0 Demonstrate proficiency in identifying the server physical and logical architecture-The student will be able to:

08.01 Identify and define the Server architecture.
08.02 Identify and utilize the functions and processes of the Server.
08.03 Create a database and construct the base data dictionary.
08.04 Start up and shut down a database and instance.

09.0 Demonstrate proficiency in implementing and backup and recovery planning and backup of a server-The student will be able to:

09.01 Identifying backup and recovery techniques.
09.02 Define architecture implications for backup and recovery.
09.03 Examining various failure scenarios and determining proper recovery strategies.
09.04 Identify methods for restoration and recovery.

10.0 Demonstrate proficiency in implementing a Net8 configuration on the server and workstation-The student will be able to:

10.01 Establishing a connection from the Net8 client and server using connection methods.
10.02 Implement troubleshooting strategies for the Networking environment.
10.03 Explain security features in networking products.
10.04 Identify network problems using log and trace files.
10.05 Set logging and tracing parameters.
10.06 Start and stop the Intelligent Agent using the Listener Control utility.
10.07 Identify the configuration files used to define the intelligent agent.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Information Technology Support Specialist**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507.030606
Program Type	College Credit Certificate (CCC)
Program Length	18 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1041
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Computer Information Technology AS/AAS degree program (0507.030606).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to installation of information technology equipment, troubleshooting information technology equipment, and supporting information technology users.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Understand, install and configure computer hardware.
02.0 Understand, Install and configure computer software
03.0 Demonstrate understanding of networked environments
04.0 Perform technical system support functions
05.0 Perform troubleshooting activities.
06.0 Perform systems monitoring activities.
07.0 Perform customer service skills.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Information Technology Support Specialist**
CIP Number: **0507.030606**
Program Length: **18 credit hours**
SOC Code(s): **15-1041**

This certificate program is part of the Computer Information Technology AS/AAS degree program (0507.030600). At the completion of this program, the student will be able to:

01.0 Understand, install and configure computer hardware. The student will be able to:

- 01.01 Explain the use of binary numbers to represent instructions and data.
- 01.02 Describe the hardware implications of the use of binary representation of instructions and data.
- 01.03 Convert numbers among decimal, binary, and hexadecimal representation.
- 01.04 Perform binary arithmetic.
- 01.05 Identify various coding schemes (ASCII, etc.).
- 01.06 Discuss various data types (signed and unsigned integers, floating point, etc).
- 01.07 Identify the major hardware platforms.
- 01.08 Describe distinguishing features of the major hardware platforms.
- 01.09 Set up and use multiple hardware platforms built on various processor architectures.
- 01.10 Describe the functions of major hardware components of a computer system.
- 01.11 Recognize and correctly identify computing hardware components.
- 01.12 Set up and configure systems and peripherals.
- 01.13 Set up and upgrade BIOS.
- 01.14 Install and configure storage and I/O device interfaces.
- 01.15 Install and configure multimedia devices and interfaces.
- 01.16 Describe emerging hardware technologies and discuss their potential impact.
- 01.17 Implement proper procedures for handling and safeguarding equipment.
- 01.18 Perform preventive maintenance tasks on microcomputer systems.
- 01.19 Describe procedures for proper disposal of computer components.
- 01.20 Review installation specifications
- 01.21 Unpack all components, file and disseminate all inventory and warranty information.
- 01.22 Assure all components are present and functional
- 01.23 Install and configure network hardware components.
- 01.24 Perform component and system level upgrades.
- 01.25 Disassemble and re-assemble a microcomputer system completely.
- 01.26 Describe principles of computer organization as they apply to typical microcomputer equipment.
- 01.27 Draw a schematic of a typical microcomputer system.
- 01.28 Describe the architecture of a typical microcomputer system.
- 01.29 Discuss issues that affect system design and construction (redundancy, fault tolerance, etc.)

02.0 Understand, Install and configure computer software. The student will be able to:

02.01 Describe the functions and major components (BIOS, task management, etc.) of a computer operating system.
02.02 Identify current operating systems and describe their vital features.
02.03 Use an operating system for activities such as data and file management.
02.04 Identify current systems utilities and describe their functions.
02.05 Use system software to perform routine maintenance tasks such as backup, hard drive defragmentation, etc.
02.06 Use operating systems of different brands and platforms.
02.07 Use both stand-alone operating systems and network operating systems.
02.08 Create, use, and maintain system configuration files.
02.09 Make configuration changes to an operating system to optimize performance.
02.10 Transmit and exchange data files in a multiple platform hardware environment.
02.11 Describe the primary features and functions of the major categories of applications software (word processing, database, spreadsheet, presentation, e-mail, browsers, etc.).
02.12 Use basic features of office productivity software.
02.13 Learn independently to perform (previously untaught) tasks using office productivity software.
02.14 Use software produced by multiple vendors.
02.15 Transmit and exchange data in a multiple vendor software environment.
02.16 Use integration features of different office productivity applications software.
02.17 Use office productivity or other applications
02.18 Install and configure a microcomputer operating system.
02.19 Describe procedures for uninstalling operating system software.
02.20 Install and configure system software.
02.21 Install and configure applications software.
02.22 Configure software for accessibility by disabled individuals.
02.23 Install and configure applications software upgrades.
02.24 Describe modifications necessary to an operating system (such as modifying parameters, how to handle conflicting interrupts, etc.) when installing, configuring and upgrading typical applications software.
02.25 Install and configure client software for connecting to LANs, WANs, and the Internet (network client, WWW browser, terminal emulation, file transfer, etc.).
02.26 Install and configure client software for client/server and network-based applications (e-mail, videoconferencing, database, etc.).
02.27 Install applications on a server and configure clients for network access.
02.28 Install and configure applications software at an advanced level, such as one of the following: Computer-Aided Design (CAD), Geographical Information System (GIS), statistical software, desktop publishing, music editing system or game software.
02.29 Identify several of the most prominent current programming languages.
02.30 Characterize the stages of the system development life cycle.
02.31 Differentiate between two common strategies for problem solving.
02.32 Describe the program design and development process.
02.33 Differentiate between structured programming and object-oriented programming.
02.34 Apply principles of good design and documentation when analyzing programs.
02.35 Name several emerging software technologies.
02.36 Describe the potential impact of the named emerging software technologies.

03.0 Demonstrate understanding of networked environments. The student will be able to:

03.01 Identify several advantages and disadvantages of networked and non-networked environments.
03.02 Describe current network environments, such as peer-to-peer and client/server.
03.03 Identify and discuss issues (such as security, privacy, redundancy, etc.) related to networked environments.
03.04 Identify and discuss issues related to naming conventions for user-ids, e-mail, passwords, and network devices.
03.05 List and define layers in the OSI and TCP/IP network protocol models.
03.06 Identify and describe current relevant IEEE network standards.
03.07 Illustrate typical network topologies.
03.08 Identify advantages and disadvantages of each topology.
03.09 Describe the major functions of LAN hardware protocols such as Ethernet, token ring, FDDI, and arcnet.
03.10 Describe LAN software protocols such as IPX/SPX, TCP/IP, and NetBEUI.
03.11 Discuss the nature of IP addresses and MAC addresses, and mapping between protocol addressing schemes.
03.12 Describe the major functions of network server hardware components.
03.13 Describe server and client hardware requirements.
03.14 Describe the major functions of network client hardware components.
03.15 Differentiate between hardware used to implement different topologies such as token ring and Ethernet.
03.16 Recognize and describe current cable technologies (such as twisted-pair, coaxial, and fiber optic) and identifying issues associated with plenum verses and non-plenum cable plants.
03.17 Describe current wireless technologies such as satellite, microwave, spread spectrum RF, and infrared.
03.18 Identify advantages and disadvantages of wireless and cable technologies.
03.19 Cite appropriate uses of wireless and cable technologies.
03.20 Describe the major functions of network connectivity hardware, such as hubs, repeaters, bridges, routers, switches, and gateways.
03.21 Describe the hardware needed to connect a LAN to the Internet.
03.22 Describe the function of network storage devices and other peripherals (RAID, CD towers, printers, fax machines, scanners, printer/fax/copiers, imaging devices, and document center equipment, etc.).
03.23 Set up and configure a server (including installation of NICs and NIC drivers).
03.24 Set up and configure client hardware (including installation of NICs and NIC drivers).
03.25 Set up network storage devices and other peripherals and connect to the network.
03.26 Describe the major functions of network server software components.
03.27 Compare and contrast major functions and features of current network operating systems (including directory services).
03.28 Install and configure a LAN server.
03.29 Install and configure drivers for NICs and network peripherals.
03.30 Configure protocol stacks.
03.31 Describe the major functions of network client software components.
03.32 Install and configure client software on multiple hardware platforms.
03.33 Install and configure drivers for NICs and network peripherals (including printers).
03.34 Configure the client to support multiple protocols.
03.35 Differentiate between telecommunications and data communications.

03.36 Compare and contrast digital communications lines and cable characteristics (e.g. ISDN, DSL, T-1 and T-3).

04.0 Perform technical system support functions. The student will be able to:

04.01 Create and follow established procedures and guidelines to manage user accounts
04.02 Identify network security systems
04.03 Install system and application upgrades and patches as required
04.04 Create documentation to establish baselines for maintenance and repairs.
04.05 Update documentation including warranty and maintenance agreements.
04.06 Create and perform back-ups following organizational plan
04.07 Test contingency systems to reduce damage due to disaster
04.08 Perform data recovery as needed
04.09 Document statistics to identify problems and plans for systems upgrades

05.0 Perform troubleshooting activities. The student will be able to:

05.01 Describe the use of diagnostic test equipment.
05.02 Describe features of diagnostic software.
05.03 Use system, software, and network documentation.
05.04 Locate and use online documentation resources.
05.05 Describe effective troubleshooting strategies and techniques to resolve basic hardware problems including interviewing and observation
05.06 Recognize and resolve basic hardware problems.
05.07 Recognize and resolve basic software configuration problems.
05.08 Recognize and resolve system level software conflicts (e.g., IRQ conflicts).
05.09 Recognize and resolve problems originating from software interaction.
05.10 Recognize and resolve problems originating from software/hardware interaction.
05.11 Isolate and replace faulty components (board level only).
05.12 Effectively use appropriate research tools to locate information needed to solve system problems.
05.13 Perform systems troubleshooting tasks on multiple platforms
05.14 Follow a structured methodology and use effective troubleshooting strategies and techniques to resolve problems with systems, peripheral devices and/or drivers, and network problems
05.15 Use sniffers, cable testers, and other network troubleshooting tools.
05.16 Use utilities such as ping, telnet, and trace route in testing a network.
05.17 Test WAN links using loop back techniques.
05.18 Identify when to escalate the issue, including determining appropriate entities involved.
05.19 Observe and document results
05.20 Test the solution to ensure quality
05.21 Document the final solution
05.22 Disseminate the solution
05.23 Follow up with the customer

06.0 Perform systems monitoring activities. The student will be able to:

06.01 Create and review back up log
06.02 Create and review server log

06.03 Create and review application logs
06.04 Create and review resolution logs
06.05 Create and review security logs
06.06 Prepare a schedule to verify applications status
06.07 Prepare a schedule to verify backup status
06.08 Prepare a schedule to verify server status
06.09 Track network performance as compare to an established baseline
06.10 Identify problem trends and create resolution plans.
06.11 Document statistical analysis and monitoring activities

07.0 Perform Customer Service Skills – The student will be able to:

07.01 Identify and recognize user's state of mind and attitude
07.02 Determine the customer needs using system analysis strategies
07.03 Listen to the customer and ask appropriate questions
07.04 Maintain a professional demeanor when dealing with difficult customers
07.05 Provide suggested solutions using knowledge base
07.06 Project professional appearance and demeanor
07.07 Promote company services, products, and policies when appropriate
07.08 Use tact when dealing with customers and competitors.
07.09 Maintain professional work ethics and follow policies and procedures
07.10 Respect customer work space/environment.
07.11 Relate all information to customer in a manner that the customer can understand.
07.12 Set realistic expectations when establishing deadlines for customer solutions
07.13 Communicate action plan including timelines
07.14 Recognize the existence of internal/external customers and follow appropriate guidelines for each

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Information Technology Analysis**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507.030607
Program Type	College Credit Certificate (CCC)
Program Length	27 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1051
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Computer Information Technology AS/AAS degree program (0507.030600).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to microcomputer oriented operating procedures, software applications packages, and hardware in order to select the appropriate information technology equipment for a particular microcomputer-based work environment; install information technology equipment, troubleshoot information technology equipment, support information technology users.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Understand, install and configure computer hardware.
02.0 Understand, Install and configure computer software
03.0 Demonstrate understanding of networked environments
04.0 Demonstrate understanding of internet structure, organization and navigation.
05.0 Perform technical system support functions
06.0 Perform troubleshooting activities.
07.0 Perform systems monitoring activities.
08.0 Perform computer information systems analysis activities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Information Technology Analysis**
CIP Number: **0507.030607**
Program Length: **27 credit hours**
SOC Code(s): **15-1051**

This certificate program is part of the Computer Information Technology AS/AAS degree program (0507.030600). At the completion of this program, the student will be able to:

01.0 Understand, install and configure computer hardware. The student will be able to:

- 01.01 Explain the use of binary numbers to represent instructions and data.
- 01.02 Describe the hardware implications of the use of binary representation of instructions and data.
- 01.03 Convert numbers among decimal, binary, and hexadecimal representation.
- 01.04 Perform binary arithmetic.
- 01.05 Identify various coding schemes (ASCII, etc.).
- 01.06 Discuss various data types (signed and unsigned integers, floating point, etc).
- 01.07 Identify the major hardware platforms.
- 01.08 Describe distinguishing features of the major hardware platforms.
- 01.09 Set up and use multiple hardware platforms built on various processor architectures.
- 01.10 Describe the functions of major hardware components of a computer system.
- 01.11 Recognize and correctly identify computing hardware components.
- 01.12 Set up and configure systems and peripherals.
- 01.13 Set up and upgrade BIOS.
- 01.14 Install and configure storage and I/O device interfaces.
- 01.15 Install and configure multimedia devices and interfaces.
- 01.16 Describe emerging hardware technologies and discuss their potential impact.
- 01.17 Implement proper procedures for handling and safeguarding equipment.
- 01.18 Perform preventive maintenance tasks on microcomputer systems.
- 01.19 Describe procedures for proper disposal of computer components.
- 01.20 Review installation specifications
- 01.21 Unpack all components, file and disseminate all inventory and warranty information.
- 01.22 Assure all components are present and functional
- 01.23 Install and configure network hardware components.
- 01.24 Perform component and system level upgrades.
- 01.25 Disassemble and re-assemble a microcomputer system completely.
- 01.26 Describe principles of computer organization as they apply to typical microcomputer equipment.
- 01.27 Draw a schematic of a typical microcomputer system.
- 01.28 Describe the architecture of a typical microcomputer system.
- 01.29 Discuss issues that affect system design and construction (redundancy, fault tolerance, etc.)

02.0 Understand, Install and configure computer software. The student will be able to:

02.01 Describe the functions and major components (BIOS, task management, etc.) of a computer operating system.
02.02 Identify current operating systems and describe their vital features.
02.03 Use an operating system for activities such as data and file management.
02.04 Identify current systems utilities and describe their functions.
02.05 Use system software to perform routine maintenance tasks such as backup, hard drive defragmentation, etc.
02.06 Use operating systems of different brands and platforms.
02.07 Use both stand-alone operating systems and network operating systems.
02.08 Create, use, and maintain system configuration files.
02.09 Make configuration changes to an operating system to optimize performance.
02.10 Transmit and exchange data files in a multiple platform hardware environment.
02.11 Describe the primary features and functions of the major categories of applications software (word processing, database, spreadsheet, presentation, e-mail, browsers, etc.).
02.12 Use basic features of office productivity software.
02.13 Learn independently to perform (previously untaught) tasks using office productivity software.
02.14 Use software produced by multiple vendors.
02.15 Transmit and exchange data in a multiple vendor software environment.
02.16 Use integration features of different office productivity applications software.
02.17 Use office productivity or other applications
02.18 Install and configure a microcomputer operating system.
02.19 Describe procedures for uninstalling operating system software.
02.20 Install and configure system software.
02.21 Install and configure applications software.
02.22 Configure software for accessibility by disabled individuals.
02.23 Install and configure applications software upgrades.
02.24 Describe modifications necessary to an operating system (such as modifying parameters, how to handle conflicting interrupts, etc.) when installing, configuring and upgrading typical applications software.
02.25 Install and configure client software for connecting to LANs, WANs, and the Internet (network client, WWW browser, terminal emulation, file transfer, etc.).
02.26 Install and configure client software for client/server and network-based applications (e-mail, videoconferencing, database, etc.).
02.27 Install applications on a server and configure clients for network access.
02.28 Install and configure applications software at an advanced level, such as one of the following: Computer-Aided Design (CAD), Geographical Information System (GIS), statistical software, desktop publishing, music editing system or game software.
02.29 Identify several of the most prominent current programming languages.
02.30 Characterize the stages of the system development life cycle.
02.31 Differentiate between two common strategies for problem solving.
02.32 Describe the program design and development process.
02.33 Differentiate between structured programming and object-oriented programming.
02.34 Apply principles of good design and documentation when analyzing programs.
02.35 Name several emerging software technologies.
02.36 Describe the potential impact of the named emerging software technologies.

03.0 Demonstrate understanding of networked environments. The student will be able to:

03.01 Identify several advantages and disadvantages of networked and non-networked environments.
03.02 Describe current network environments, such as peer-to-peer and client/server.
03.03 Identify and discuss issues (such as security, privacy, redundancy, etc.) related to networked environments.
03.04 Identify and discuss issues related to naming conventions for user-ids, e-mail, passwords, and network devices.
03.05 List and define layers in the OSI and TCP/IP network protocol models.
03.06 Identify and describe current relevant IEEE network standards.
03.07 Illustrate typical network topologies.
03.08 Identify advantages and disadvantages of each topology.
03.09 Describe the major functions of LAN hardware protocols such as Ethernet, token ring, FDDI, and arcnet.
03.10 Describe LAN software protocols such as IPX/SPX, TCP/IP, and NetBEUI.
03.11 Discuss the nature of IP addresses and MAC addresses, and mapping between protocol addressing schemes.
03.12 Describe the major functions of network server hardware components.
03.13 Describe server and client hardware requirements.
03.14 Describe the major functions of network client hardware components.
03.15 Differentiate between hardware used to implement different topologies such as token ring and Ethernet.
03.16 Recognize and describe current cable technologies (such as twisted-pair, coaxial, and fiber optic) and identifying issues associated with plenum verses and non-plenum cable plants.
03.17 Describe current wireless technologies such as satellite, microwave, spread spectrum RF, and infrared.
03.18 Identify advantages and disadvantages of wireless and cable technologies.
03.19 Cite appropriate uses of wireless and cable technologies.
03.20 Describe the major functions of network connectivity hardware, such as hubs, repeaters, bridges, routers, switches, and gateways.
03.21 Describe the hardware needed to connect a LAN to the Internet.
03.22 Describe the function of network storage devices and other peripherals (RAID, CD towers, printers, fax machines, scanners, printer/fax/copiers, imaging devices, and document center equipment, etc.).
03.23 Set up and configure a server (including installation of NICs and NIC drivers).
03.24 Set up and configure client hardware (including installation of NICs and NIC drivers).
03.25 Set up network storage devices and other peripherals and connect to the network.
03.26 Describe the major functions of network server software components.
03.27 Compare and contrast major functions and features of current network operating systems (including directory services).
03.28 Install and configure a LAN server.
03.29 Install and configure drivers for NICs and network peripherals.
03.30 Configure protocol stacks.
03.31 Describe the major functions of network client software components.
03.32 Install and configure client software on multiple hardware platforms.
03.33 Install and configure drivers for NICs and network peripherals (including printers).
03.34 Configure the client to support multiple protocols.
03.35 Differentiate between telecommunications and data communications.

03.36 Compare and contrast digital communications lines and cable characteristics (e.g. ISDN, DSL, T-1 and T-3).

04.0 Demonstrate understanding of internet structure, organization and navigation. The student will be able to:

04.01 Describe the origin, structure, and history of the Internet.
04.02 Describe Internet organization, such as the Internic, domains and requests for comments (RFCs).
04.03 Differentiate between the Internet and the WWW.
04.04 Define Internet push technologies, such as e-mail marketing vs. Web page banner advertising.
04.05 Describe Web e-commerce.
04.06 Differentiate among an Intranet site, an extranet site, and an Internet site.
04.07 Characterize the role of the Internet in today's society.
04.08 Describe several major ethical issues related to Internet use.
04.09 Identify several legal issues related to Internet use.
04.10 Cite several examples to demonstrate how the Internet has affected intellectual property rights.
04.11 Identify several examples to demonstrate how the Internet has affected personal security and privacy.
04.12 Describe the World Wide Web (WWW).
04.13 Cite several examples to show how the WWW has affected our society.
04.14 Demonstrate the use of typical file types and protocols (http:, ftp:, mailto:, gopher:, telnet:, etc.).
04.15 Demonstrate the use of typical remote access mechanisms.
04.16 Describe components of URL and their meanings (including types).
04.17 Use Internet tools effectively and utilities such as e-mail, browsers, search engines, news groups, list serves, chat rooms, file transfers.
04.18 Install and configure an Internet browser.
04.19 Install and configure browser add-ons and plug-ins.
04.20 Describe the Human-Computer Interaction (HCI) factors that impact the design of a Web page and Web site
04.21 Describe and use the process of storyboarding a Web site.
04.22 Describe format, structure and design principles for Web sites.
04.23 Evaluate Web sites using principles of good format, structure, and design.
04.24 List several Web authoring tools in order of complexity of use.
04.25 Describe handicapped-accessibility features for a Web site.
04.26 Evaluate a Web site for handicapped accessibility.

05.0 Perform technical system support functions. The student will be able to:

05.01 Create and follow established procedures and guidelines to manage user accounts
05.02 Identify network security systems
05.03 Install system and application upgrades and patches as required
05.04 Create documentation to establish baselines for maintenance and repairs.
05.05 Update documentation including warranty and maintenance agreements.
05.06 Create and perform back-ups following organizational plan
05.07 Test contingency systems to reduce damage due to disaster
05.08 Perform data recovery as needed

05.09 Document statistics to identify problems and plans for systems upgrades.

06.0 Perform troubleshooting activities. The student will be able to:

06.01 Describe the use of diagnostic test equipment.
06.02 Describe features of diagnostic software.
06.03 Use system, software, and network documentation.
06.04 Locate and use online documentation resources.
06.05 Describe effective troubleshooting strategies and techniques to resolve basic hardware problems including interviewing and observation
06.06 Recognize and resolve basic hardware problems.
06.07 Recognize and resolve basic software configuration problems.
06.08 Recognize and resolve system level software conflicts (e.g., IRQ conflicts).
06.09 Recognize and resolve problems originating from software interaction.
06.10 Recognize and resolve problems originating from software/hardware interaction.
06.11 Isolate and replace faulty components (board level only).
06.12 Effectively use appropriate research tools to locate information needed to solve system problems.
06.13 Perform systems troubleshooting tasks on multiple platforms
06.14 Follow a structured methodology and use effective troubleshooting strategies and techniques to resolve problems with systems, peripheral devices and/or drivers, and network problems
06.15 Use sniffers, cable testers, and other network troubleshooting tools.
06.16 Use utilities such as ping, telnet, and trace route in testing a network.
06.17 Test WAN links using loop back techniques.
06.18 Identify when to escalate the issue, including determining appropriate entities involved.
06.19 Observe and document results
06.20 Test the solution to ensure quality
06.21 Document the final solution
06.22 Disseminate the solution
06.23 Follow up with the customer.

07.0 Perform systems monitoring activities. The student will be able to:

07.01 Create and review back up log
07.02 Create and review server log
07.03 Create and review application logs
07.04 Create and review resolution logs
07.05 Create and review security logs
07.06 Prepare a schedule to verify applications status
07.07 Prepare a schedule to verify backup status
07.08 Prepare a schedule to verify server status
07.09 Track network performance as compare to an established baseline
07.10 Identify problem trends and create resolution plans.
07.11 Document statistical analysis and monitoring activities

08.0 Perform Computer Information systems Analysis Activities – The student will be able to:

08.01 Prepare appropriate systems and analysis charts and other visual aids.
08.02 Describe the major steps in the systems development cycle.

08.03 Perform basic business related tasks using the most appropriate software applications.
08.04 Identify situations where software packages and/or custom developed packages need to be integrated with each other.
08.05 Identify situations where software packages and/or hardware need to be integrated with software/hardware available on other types of computers.
08.06 Select appropriate hardware devices to accomplish assigned tasks.
08.07 Identify appropriate vendor sources for software, hardware and auxiliary supplies.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Oracle Software Engineering**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507.030611
Program Type	College Credit Certificate (CCC)
Program Length	33 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1031
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Database Technology AS/AAS degree program (0507.030601).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to database systems, software, programming and analysis and design of databases.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate proficiency in developing and operating a database.
02.0 Demonstrate proficiency in manipulating a database and creating tables and data structures.
03.0 Demonstrate proficiency in developing applications and using the procedure builder tool.
04.0 Demonstrate proficiency in creating SQL procedural language blocks of application code that can be shared by multiple forms, reports and data management applications.
05.0 Demonstrate proficiency in creating a complete Forms application using Developer/2000 while working in a graphical user interface (GUI) development environment.
06.0 Demonstrate proficiency in designing multiple forms applications.
07.0 Demonstrate proficiency in developing a variety of standard and custom reports using the reports component of Developer/2000 in a client/server environment.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Oracle Software Engineer**
CIP Number: **0507.030611**
Program Length: **33 credit hours**
SOC Code(s): **15-1031**

This certificate program is part of the Database Technology AS/AAS degree program (0507.030601). At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency in developing and operating a database --The student will be able to:

01.01 Build a relational database.
01.02 Query, display, and format data.
01.03 Save, retrieve, and run queries.
01.04 Build and format reports.
01.05 Group and summarize data.

02.0 Demonstrate proficiency in manipulating a database and creating tables and data structures--The student will be able to:

02.01 Insert, update, automatically generate, and delete data.
02.02 Control transaction processing.
02.03 Create, confirm, modify and remove tables to store data.
02.04 Apply business rules to ensure data integrity.
02.05 Restrict user access to tables.
02.06 Improve query performance.

03.0 Demonstrate proficiency in developing applications and using the procedure builder tool--The student will be able to:

03.01 Develop programs in PL/SQL.
03.02 Insert and manipulate data with PL/SQL.
03.03 Manage and execute program units using the Object Navigator and the PL/SQL Interpreter.
03.04 Define and compile procedures using the Program Unit Editor.
03.05 Control the execution of a PL/SQL program unit.
03.06 Test possible solutions by making changes to variables and procedures at runtime.

04.0 Demonstrate proficiency in creating PL/SQL procedural language blocks of application code that can be shared by multiple forms, reports and data management applications -- The student will be able to:

04.01 Nest sub-queries within another SQL procedural language command.
04.02 Develop applications using procedural capabilities.
04.03 Insert and manipulate data with SQL procedural language.
04.04 Use the procedure builder tool to develop and debug SQL procedural language

code.

04.05 Manage and execute program units using the object navigator and the SQL procedural language interpreter.
04.06 Define environmental requirements for peripherals and media.
04.07 Define and compile procedures using the program unit editor.
04.08 Control the execution of an SQL procedural language program unit

05.0 Demonstrate proficiency in creating a complete forms application using Developer/2000 while working in a graphical user interface (GUI) development environment--The student will be able to:

05.01 Build a new data block using an existing table specification.
05.02 Save and run a form module from the designer.
05.03 Develop a master/detail form module.
05.04 Identify characteristics of each forms file storage type.
05.05 Create forms containing check boxes, radio groups, containing list items, display items, image items and buttons.
05.06 Start additional forms with the same transaction and session.
05.07 Enhance the default menu.
05.08 Add basic menu items.
05.09 Attach a menu module to a forms module.
05.10 Saving and running a form module from the designer.

06.0 Demonstrate proficiency in designing multiple forms applications--The student will be able to:

06.01 Redefine function keys and determining when key triggers should be used or avoided.
06.02 Cause a form module to respond to mouse movement and mouse button actions.
06.03 Creating trigger code to interact with windows.
06.04 Build robust multiple form transactions.
06.05 Choose between different ways of invoking forms.
06.06 Pass data between forms using parameter lists.
06.07 Control coded events and methods.

07.0 Demonstrate proficiency in developing a variety of standard and custom reports using the reports component of Developer/2000 in a client/server environment --The student will be able to:

07.01 Design and execute a simple report.
07.02 Manage the appearance and display of data in reports with layout objects.
07.03 Customize the display of data in reports.
07.04 Tailor the appearance of simple and advanced business reports.
07.05 Integrating text and graphics in reports.
07.06 Import charts and graphs from the graphics component of Developer/2000.
07.07 Applying the packaged functions and procedures supplied with the reports component of Developer/2000.
07.08 Write queries to retrieve data.
07.09 Manage the structure of data in reports using data objects.
07.10 Determine how to best produce reports by analyzing report structures.
07.11 Filter report information from the database server.

07.12 Implement graphics into reports.
07.13 Build modules in Developer 2000 Reports for use with other Developer/2000 tools.
07.14 Manage module storage and security.
07.15 Build reports in which the end user supplies values at runtime to control report output.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Oracle Certified Administrator**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507.030612
Program Type	College Credit Certificate (CCC)
Program Length	33 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1061
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Database Technology AS/AAS degree program (0507.030601).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to database systems, software, management, and administration of databases.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate proficiency in developing and operating a database.
02.0 Demonstrate proficiency in manipulating a database and creating tables and data structures.
03.0 Demonstrate proficiency in identifying the Server Physical and Logical architecture.
04.0 Demonstrate proficiency in implementing and planning backup and recovery for the Server.
05.0 Demonstrate proficiency in implementing a Net8 configuration on a workstation and server.
06.0 Demonstrate proficiency in tuning a Server.
07.0 Demonstrate proficiency in implementing Database Security.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Oracle Certified Administrator**
CIP Number: **0507.030612**
Program Length: **33 credit hours**
SOC Code(s): **15-1061**

This certificate program is part of the Database Technology AS/AAS degree program (0507.030601). At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency in developing and operating a database --The student will be able to:

01.01 Build a relational database.
01.02 Query, display, and format data.
01.03 Save, retrieve, and run queries.
01.04 Build and format reports.
01.05 Group and summarize data.

02.0 Demonstrate proficiency in manipulating a database and creating tables and data structures--The student will be able to:

02.01 Insert, update, automatically generate, and delete data.
02.02 Control transaction processing.
02.03 Create, confirm, modify and remove tables to store data.
02.04 Apply business rules to ensure data integrity.
02.05 Restrict user access to tables.
02.06 Improve query performance.

03.0 Demonstrate proficiency in identifying the Server Physical and Logical architecture-The student will be able to:

03.01 Identify and define the Server architecture.
03.02 Identify and utilize the functions and processes of the Server.
03.03 Create a database and construct the base data dictionary.
03.04 Start up and shut down a database and instance.

04.0 Demonstrate proficiency in implementing and backup and recovery planning and backup of a server --The student will be able to:

04.01 Identifying backup and recovery techniques.
04.02 Define architecture implications for backup and recovery.
04.03 Examining various failure scenarios and determining proper recovery strategies.
04.04 Identify methods for restoration and recovery.

05.0 Demonstrate proficiency in implementing a Net8 configuration on the server and workstation--The student will be able to:

05.01 Establishing a connection from the Net8 client and server using connection

methods.
05.02 Implement troubleshooting strategies for the Networking environment.
05.03 Explain security features in networking products.
05.04 Identify network problems using log and trace files.
05.05 Set logging and tracing parameters.
05.06 Start and stop the Intelligent Agent using the Listener Control utility.
05.07 Identify the configuration files used to define the intelligent agent.

06.0 Demonstrate proficiency in tuning a server--The student will be able to:

06.01 Explain the nature of Server tuning.
06.02 Outline the tuning methodology.
06.03 List and define available diagnostic tools.
06.04 Running the UTLBSTAT/UTLESTAT utility.
06.05 Exam latch contention.
06.06 Diagnose inappropriate use of the SYSTEM and TEMP
06.07 Tablespaces. .
06.08 Ensure that files are distributed to minimize 1/0 contention.

07.0 Demonstrate proficiency in implementing database security--The student will be able to:

07.01 Demonstrate an understanding of essential database security.
07.02 Set up and administer users and groups.
07.03 Use appropriate procedures to secure database resources.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Geographic Information System CCC**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507030613
Program Type	College Credit Certificate (CCC)
Program Length	21 Credit Hours
CTSO	Phi Beta Lambda and BPA
SOC Codes (all applicable)	15-1099.07 Geographic Information Systems Technicians
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Computer Information Technology AS/AAS degree program (0507030600).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to the creation of maps; creation of geographic data files; manipulation of geographic data; and analysis of geographic data using appropriate software.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this program the student will be able to perform the following:

01.0 Perform general computer application activities.
02.0 Demonstrate an understanding of geographic coordinate systems.
03.0 Perform map creation activities.
04.0 Perform GIS data file creation activities.
05.0 Perform GIS data file manipulation activities.
06.0 Perform GIS analysis activities.
07.0 Perform database operations.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Geographic Information System CCC**
CIP Number: **0507030613**
Program Length: **21 Credit Hours**
SOC Code(s): **15-1099.07 Geographic Information Systems Technician**

This certificate program is part of the Computer Information Technology AS/AAS degree program (0507030600). At the completion of this program, the student will be able to:

01.0 Perform general computer application activities – The student will be able to:

- 01.01 Select the most efficient method of file organization for a given situation.
- 01.02 Identify security procedures to maintain integrity of files.
- 01.03 Create reports using a word processing application.
- 01.04 Analyze numerical information using a spreadsheet application.
- 01.05 Create a database for storing information using a database application .
- 01.06 Communicate using an e-mail program.
- 01.07 Retrieve information from the Internet.

02.0 Demonstrate an understanding of geographic coordinate systems – The student will be able to:

- 02.01 Differentiate between different models for the shape of the earth.
- 02.02 Describe the characteristics of a global coordinate system.
- 02.03 Describe the characteristics of a geographic datum.
- 02.04 Compare and contrast different map projections.
- 02.05 Detail the characteristic of the Cartesian coordinate system.
- 02.06 Detail the UTM, UPS and State Plane coordinate systems.

03.0 Perform map creation activities – The student will be able to:

- 03.01 Set the appropriate geographic coordinate system for a map in the GIS application.
- 03.02 Add geographic data layers to a GIS application.
- 03.03 Manipulate data files that do not align correctly.
- 03.04 Symbolize each layer appropriately.
- 03.05 Label map features as needed.
- 03.06 Add map components such as legends, titles, scale bars, north arrows etc.
- 03.07 Publish the complete map in paper and electronic formats.

04.0 Perform GIS data file creation activities. – The student will be able to:

- 04.01 Subset existing GIS data files to create new files.
- 04.02 Combine existing, adjacent GIS data files together to create new files.
- 04.03 Collect coordinate information using a GPS receiver in the correct geographical coordinate system.
- 04.04 Create new GIS data files using coordinate information.

04.05 Register aerial photographs or satellite images to a specific geographical coordinate system.
04.06 Create new GIS data files by digitizing on top of registered images.

05.0 Perform GIS data file manipulation activities – The student will be able to:

05.01 Create, delete and move GIS files between folders and computers.
05.02 Add metadata to GIS files.
05.03 Set coordinate system information for a GIS file.
05.04 Reproject GIS files to different coordinate systems.
05.05 Add and delete fields to a GIS database.
05.06 Manipulate values of field within the GIS database.

06.0 Perform GIS spatial analysis activities – The student will be able to:

06.01 Generalize maps by merging adjacent areas if they contain the same or similar attributes.
06.02 Overlay GIS files that cover the same area to create new files.
06.03 Create buffers around map features.
06.04 Manipulate digital elevation models (DEM's) to create slope, aspect, view shed and hill shade layers.
06.05 Create density maps from point features.
06.06 Interpolate point features to create continuous surfaces.
06.07 Generate spatial statistics on GIS files.

07.0 Perform database operations – The student will be able to:

07.01 Build a relational database
07.02 Query, display and format data.
07.03 Save, retrieve and run queries.
07.04 Build and format reports.
07.05 Group and summarize data.
07.06 Insert, update, automatically generate and delete data.
07.07 Control transaction processing.
07.08 Create, confirm, modify and remove tables to store data.
07.09 Apply business rules to ensure data integrity.
07.10 Restrict user access to tables.
07.11 Improve query performance.
07.12 Develop programs in PL/SQL.
07.13 Insert and manipulate data with PL/SQL.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Internet Services Technology**
Career Cluster: **Information Technology**

	AS	AAS
CIP Number	1507.039902	0507.039902
Program Type	College Credit	College Credit
Standard Length	63 credit hours	63 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1099.04	15-1099.04
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as Internet/Intranet Technicians, Web Technicians, Internet/Intranet Administrators, Web Administrators, Internet/Intranet Developers, Web Site Developers, Internet/Intranet Masters, Web Masters, Internet support specialists, Web page designers, Web database administrators, Internet managers, Web technicians, Web site developers, Web managers, or Web architects in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to work in Internet, Intranet, and Extranet environments; installing, configuring, designing and managing Intranet and web-based resources.

Program Structure

This program is a planned sequence of instruction consisting of 63 hours.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these

occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Program Length

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. The standard length of this program is 63 credit hours according to Rule 6A-14.030, F.A.C.

Certificate Programs

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).This AS/AAS degree program includes the following College Credit Certificates:

Information Technology Administration (0507.039903) – 18 credit hours
Web Development Specialist (0507.039904) – 30 credit hours

Standards for the above certificate programs are contained in separate curriculum frameworks.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Demonstrate proficiency with Internet structure, organization, and navigation.
02.0 Demonstrate understanding of networked environments, hardware and software.
03.0 Perform server installation and configuration activities.
04.0 Understand, install and configure computer hardware
05.0 Understand, install and configure computer software
06.0 Perform enterprise architecture-related tasks.
07.0 Perform web design/development activities.
08.0 Perform programming and scripting activities.
09.0 Perform testing/troubleshooting activities.
10.0 Perform security activities.
11.0 Perform web site management activities
12.0 Perform e-commerce-related tasks.
13.0 Perform quantitative analysis activities.
14.0 Demonstrate professional development skills.
15.0 Perform Documentation and Technical reference activities
16.0 Demonstrate employability skills.
17.0 Perform general organizational computing workplace competencies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Internet Services Technology**
CIP Numbers: **1507.039902 AS, 0507.039902 AAS**
Program Length: **63 credit hours**
SOC Code(s): **15-1099.04**

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency with Internet structure, organization, and navigation - The student will be able to:

01.01 Describe the origin of the Internet.
01.02 Outline the history of the Internet.
01.03 Describe Internet organization, such as the Internic, domains and requests for comments (RFCs).
01.04 Describe the structure of the Internet.
01.05 Differentiate between the Internet and the WWW.
01.06 Define Internet push technologies, such as e-mail marketing vs. Web page banner advertising.
01.07 Differentiate among an Intranet site, an extranet site, and an Internet site.
01.08 Characterize the role of the Internet in today's society.
01.09 Describe several major ethical issues related to Internet use.
01.10 Identify several legal issues related to Internet use.
01.11 Identify several examples to show how the Internet has affected intellectual property rights.
01.12 Identify several examples to show how the Internet has affected personal security and privacy.
01.13 Describe the World Wide Web (WWW).
01.14 Provide several examples to show how the WWW has affected our society.
01.15 Demonstrate the use of typical file types and protocols (http:, ftp:, mailto:, gopher:, telnet:, etc.).
01.16 Demonstrate the use of typical remote access mechanisms.
01.17 Differentiate among all valid WWW file types.
01.18 Differentiate among all WWW multimedia file types.
01.19 Describe components of URL and their meanings (including types).
01.20 Effectively use Internet tools and utilities such as e-mail, browsers, search engines, news groups, list serves, chat rooms, file transfers.
01.21 Install and configure an Internet browser.
01.22 Install and configure browser add-ons and plug-ins.
01.23 Install and configure a newsgroup reader.
01.24 Install and configure a chat group client.

02.0 Demonstrate understanding of networked environments, hardware, and software - The student will be able to:

02.01 Give several advantages and disadvantages of networked and non-networked environments.
02.02 Describe current network environments, such as peer-to-peer and client/server.
02.03 Identify and discuss issues (such as security, privacy, redundancy, etc.) related to networked environments.
02.04 Identify and discuss issues related to naming conventions for user-ids, email, passwords, and network devices.
02.05 List and define layers in the OSI and TCP/IP network protocol models.
02.06 Identify and describe current relevant IEEE network standards.
02.07 Illustrate typical network topologies.
02.08 Identify advantages and disadvantages of each topology.
02.09 Describe the major functions of LAN hardware protocols such as Ethernet, token ring, FDDI, and arcnet.
02.10 Describe LAN software protocols such as IPX/SPX, TCP/IP, and NetBEUI.
02.11 Discuss the nature of IP addresses and MAC addresses, and mapping between protocol addressing schemes.
02.12 Describe the major functions of network server hardware and software components.
02.13 Describe server hardware requirements.
02.14 Describe the hardware needed for hosting a Web site.
02.15 Identify a variety of specialized servers (e.g. proxy, e-mail, DHCP, Web, etc.)
02.16 Describe the hardware requirements for specialized servers (such as e-mail, database).
02.17 Describe the major functions of network client hardware components.
02.18 Describe client hardware requirements.
02.19 Differentiate between hardware used to implement different topologies such as token ring and Ethernet.
02.20 Recognize and describe current cable technologies such as twisted-pair, coaxial, and fiber optic, and identifying issues associated with plenum verses non-plenum cable plants.
02.21 Describe current wireless technologies such as satellite, microwave, spread spectrum RF, and infrared.
02.22 Identify advantages and disadvantages of wireless and cable technologies.
02.23 Cite appropriate uses of wireless and cable technologies.
02.24 Describe the major functions of network connectivity hardware, such as hubs, repeaters, bridges, routers, switches, and gateways.
02.25 Describe the hardware needed to connect a LAN to the Internet.
02.26 Describe the function of network storage devices and other peripherals (RAID, CD towers, printers, fax machines, scanners, printer/fax/copiers, imaging devices, and document center equipment, etc.).
02.27 Compare and contrast major functions and features of current network operating systems (including directory services).
02.28 Differentiate between telecommunications and data communications.
02.29 Compare and contrast digital communications lines and cable characteristics (e.g. ISDN, DSL, T-1 and T-3).

03.0 Perform server installation and configuration activities - The student will be able to:

03.01 Evaluate, install and configure software for Web page authoring.
03.02 Install and configure drivers for NICs and network peripherals.
03.03 Configure protocol stacks.

03.04 Configure a server for multiple network protocols and frame types.
03.05 Configure a server to handle multiple languages for international applications.
03.06 Install and configure an Internet server.
03.07 Install, configure and set up a proxy server and a gateway.
03.08 Set up a server for remote access.
03.09 Address security issues raised by the ability to access server remotely.
03.10 Discuss the functions of authentication servers, RADIUS, and VPN.
03.11 Configure commerce server and database
03.12 Install and configure list-serve, chat, and news group servers.
03.13 Plan component integration.
03.14 Test component integration.
03.15 Integrate components.

04.0 Understand, Install and configure computer hardware - The student will be able to:

04.01 Explain the use of binary numbers to represent instructions and data.
04.02 Describe the hardware implications of the use of binary representation of instructions and data.
04.03 Convert numbers among decimal, binary, and hexadecimal representation.
04.04 Perform binary arithmetic.
04.05 Identify various coding schemes (ASCII, etc.).
04.06 Discuss various data types (signed and unsigned integers, floating point, etc.
04.07 Identify the major hardware platforms
04.08 Describe distinguishing features of the major hardware platforms
04.09 Describe the functions of major hardware components of a computer system.
04.10 Recognize and correctly identify computing hardware components.
04.11 Describe emerging hardware technologies and discuss their potential impact.
04.12 Implement proper procedures for handling and safeguarding equipment.
04.13 Perform preventive maintenance tasks on microcomputer systems.
04.14 Describe procedures for proper disposal of computer components.
04.15 Set up and configure systems and peripherals.
04.16 Set up BIOS.
04.17 Install and configure storage and I/O device interfaces.
04.18 Install and configure multimedia devices and interfaces.
04.19 Install and configure network interface cards

05.0 Understand, Install and configure computer software - The student will be able to:

05.01 Describe the functions and major components (BIOS, task management, etc.) of a computer operating system.
05.02 Identify current operating systems and describe their important features.
05.03 Use an operating system for activities such as data and file management.
05.04 Identify current systems utilities and describe their functions.
05.05 Use system software to perform routine maintenance tasks such as backup, hard drive defragmentation, etc.
05.06 Use operating systems of different brands and platforms.
05.07 Use both stand-alone operating systems and network operating systems.
05.08 Create, use, and maintain system configuration files.
05.09 Describe the major features and functions of the major categories of applications software (word processing, database, spreadsheet, presentation, email, browsers, etc.).

05.10 Use basic features of office productivity software.
05.11 Learn to perform independently (previously untaught) tasks using office productivity software.
05.12 Use software produced by multiple vendors.
05.13 Transmit and exchange data in a multiple vendor software environment.
05.14 Install and configure a microcomputer operating system.
05.15 Describe procedures for uninstalling operating system software.
05.16 Install and configure system software.
05.17 Install and configure applications software.
05.18 Configure software for accessibility by disabled individuals.
05.19 Install and configure applications software upgrades.
05.20 Describe modifications necessary to an operating system (such as modifying parameters, how to handle conflicting interrupts, etc.) when installing, configuring and upgrading typical applications software.
05.21 Install and configure client software for connecting to LANs, WANs, and the Internet (network client, WWW browser, terminal emulation, file transfer, etc.).
05.22 Install and configure client software for client/server and network-based applications (e-mail, videoconferencing, database, etc.).
05.23 Install internetworking applications on a server and configure clients for network access.
05.24 Describe the major functions of network client software components.
05.25 Install and configure client software on multiple hardware platforms.
05.26 Install and configure drivers for NICs and network peripherals (including, printers).
05.27 Configure the client to support multiple protocols.
05.28 Install and configure client/server applications (such as e-mail, scheduling, etc) on a server.
05.29 Install and configure network-based services such as videoconferencing, integrated voicemail/email/fax, large document storage and retrieval, etc.

06.0 Perform enterprise architecture-related tasks – The student will be able to:

06.01 Describe the Human-Computer Interaction (HCI) factors that impact the design of a Web page and Web site.
06.02 Determine the purpose of establishing an Internet site
06.03 Identify the intended audience that will access the Internet site
06.04 Determine user needs including secondary applications including database needs and select appropriate applications
06.05 Identify business processes to be automated.
06.06 Determine client specifications.
06.07 Determine design standards based on intended audience
06.08 Formulate architecture including bandwidth specifications
06.09 Establish performance standards and set baseline
06.10 Determine security standards that will meet business requirements.
06.11 Install and configure system based on planning

07.0 Perform web design/development activities – The student will be able to:

07.01 Describe and use the process of storyboarding a Web site.
07.02 Describe format, structure and design principles for Web sites.
07.03 Evaluate Web graphic utilities and creation tools, including those for animated

graphics.
07.04 Identify existing resources and constraints.
07.05 Evaluate design based on current industry and in-house standards
07.06 Create site navigation plan including directory structure
07.07 Procure and incorporate standard and animated graphics into a Web page.
07.08 Obtain in-house content and determine needs for secondary content providers.
07.09 Design page templates to implement on final site
07.10 Create a Web page using authoring tools.
07.11 Code page(s) using current Web programming languages.
07.12 Check page for cross-browser capability and other access issues
07.13 Upload pages and run site analysis
07.14 Incorporate sound files onto a Web page.
07.15 Incorporate a streaming video file onto a Web page.
07.16 Incorporate a video file for download into a Web page.
07.17 Create an animated graphic.
07.18 Perform simple graphic modifications using a graphics utility.
07.19 Create virtual Web pages using a virtual reality modeling language.
07.20 Incorporate an e-mail link on a Web page.
07.21 Incorporate internal and external links on a Web page.
07.22 Incorporate frames, tables, and file transfer capabilities on a Web page.
07.23 Incorporate handicapped-accessibility options into the Web site.
07.24 Set up and configure a search engine for a Web site.
07.25 Create a Web form and produce e-mail results.
07.26 Create a Web database interface.
07.27 Discuss the issue of ODBC compliance.

08.0 Perform programming and scripting activities – The student will be able to:

08.01 Identify several of the most prominent current programming languages.
08.02 Characterize the stages of the system development life cycle.
08.03 Differentiate between two common strategies for problem solving.
08.04 Describe the program design and development process.
08.05 Differentiate between structured programming and object-oriented programming.
08.06 Use procedural and object-oriented constructs of programming, scripting, and/or macro languages to create and test programs including batch files and menu programs.
08.07 Apply principles of good design and documentation when developing programs.
08.08 Write scripting code to handle error checking in client forms.
08.09 Write CGI programs to allow for interactions between the client and server.
08.10 Write Java applets.
08.11 Identify development tools and list in order of complexity of use.
08.12 Review design specifications.
08.13 Design and test algorithms.
08.14 Write program according to specs.
08.15 Test and debug code.
08.16 Revise code based on testing procedures

09.0 Perform testing/troubleshooting activities – The student will be able to:

09.01 Describe the use of diagnostic test equipment.
09.02 Describe features of diagnostic software.

09.03 Use system, software, and network documentation.
09.04 Locate and use online documentation resources.
09.05 Describe effective troubleshooting strategies and techniques to resolve basic hardware, software, and network problems.
09.06 Recognize and resolve basic hardware, software configuration, and peripheral device problems.
09.07 Use effective troubleshooting strategies and techniques to resolve network problems, including network interfaces, cabling, or other network components (hubs, switches, etc.).
09.08 Describe handicapped-accessibility features for a Web site.
09.09 Describe appropriate procedures and techniques for disaster prevention and recovery (surge suppressors, UPS, use of anti-virus software, replacement equipment plans, backups of software and data, offsite storage of backup media, etc.).
09.10 Describe appropriate security procedures and practices, including physical security and protection of resources through software measures (passwords, antivirus software, data encryption, etc.).
09.11 Develop testing plan and procedures.
09.12 Develop a system baseline.
09.13 Perform capacity testing against system baseline.
09.14 Evaluate network performance based on test outcomes.
09.15 Evaluate database performance based on test outcomes.
09.16 Evaluate server performance based on test outcomes.
09.17 Evaluate client performance based on test outcomes.
09.18 Identify bottlenecks and create a plan to improve throughput.
09.19 Optimize system based on total system evaluation.
09.20 Assess accessibility standards
09.21 Evaluate security system.
09.22 Conduct ongoing systems analysis.
09.23 Revise system as required.
09.24 Obtain final client approval for implementation and system changes.

10.0 Perform security activities – The student will be able to:

10.01 Complete a security needs evaluation.
10.02 Design security architecture.
10.03 Select security protocol.
10.04 Select and set encryption methodology.
10.05 Incorporate password protection on a Web page.
10.06 Incorporate Internet cookies into a Web page.
10.07 Configure firewall.

11.0 Perform Web Site Management Activities - The student will be able to:

11.01 Describe the process of obtaining an Internet domain address.
11.02 Register an Internet site.
11.03 Notify appropriate external search engines of the Web site.
11.04 Compare features of currently available site management tools.
11.05 Install and configure Web site management software.
11.06 Create and maintain a Web site using a Web management tool.
11.07 Implement appropriate Web site security measures.

11.08 Use and evaluate the results of a Web site visit-recording tool.

12.0 Perform e-commerce-related tasks – The student will be able to:

12.01 Describe Web e-commerce.
12.02 Analyze e-commerce models.
12.03 Develop an e-commerce business plan.
12.04 Develop e-commerce marketing plan.
12.05 Identify components and procedures necessary to process credit card transactions
12.06 Integrate credit card transaction process.
12.07 Implement shopping cart software.
12.08 Set up and configure online catalog to market products.
12.09 Establish transaction storage and reporting system
12.10 Publish web site.

13.0 Perform quantitative analysis activities – The student will be able to:

13.01 Determine type/tools available for analysis.
13.02 Determine traffic patterns.
13.03 Gather user data.
13.04 Analyze data.
13.05 Make recommendations for site improvements.

14.0 Demonstrate professional development skills – The student will be able to:

14.01 Identify corporate strategies and policies.
14.02 Maintain professional contact for future projects.
14.03 Build mentor relationships.
14.04 Anticipate future industry trends.
14.05 Continue education.
14.06 Review and analyze other industry productions.
14.07 Use and experiment with the technology.
14.08 Network with local professionals in the industry.
14.09 Read industry journals and magazines.
14.10 Attend seminars, workshops, and tradeshows.

15.0 Perform Documentation and Technical reference activities – The student will be able to:

15.01 Use technical vocabulary appropriately.
15.02 Locate information in technical references.
15.03 Prepare technical reports.
15.04 Describe appropriate documentation procedures and practices.
15.05 Effectively use locally maintained systems, software, and network documentation.
15.06 Produce and maintain system documentation, such as inventory, costs, installed software, and procedures.
15.07 Perform Documentation and Technical reference activities.
15.08 Understand, Install and configure computer hardware.
15.09 Understand, Install and configure computer software
15.10 Perform Troubleshooting activities.

15.11 Demonstrate understanding of networked environments.
15.12 Demonstrate proficiency with Internet structure, organization, and navigation.
15.13 Maintain visual network documentation, such as cabling diagrams.
15.14 Describe effective strategies for online research.
15.15 Locate technical information online.
15.16 Evaluate information located through online research.
15.17 Cite correctly Internet-based resources.

16.0 Demonstrate Employment Skills – The student will be able to:

16.01 Identify appropriate attire and grooming for a business office.
16.02 Identify sources of employment opportunities.
16.03 Discuss employer expectations regarding attendance, punctuality, initiative, teamwork, etc.
16.04 Discuss employee rights regarding privacy, discrimination, due process, safety, etc.
16.05 Explain the importance of having a written job description.
16.06 List representative jobs and career paths for people trained in the computer networking support area.
16.07 List several functions of each representative computer service oriented job and career path.
16.08 Complete employment forms.
16.09 Classify behaviors considered to be appropriate or inappropriate in a job interview situation.
16.10 Compose and type a follow-up letter.
16.11 Compose and type a letter of application and a resume.
16.12 Compose and Type a letter of resignation.
16.13 Demonstrate job interview skills.
16.14 Identify methods for securing an employment reference.

17.0 Perform general organizational computing workplace competencies – The student will be able to:

17.01 Follow oral and written instructions.
17.02 Prepare, outline, and deliver a short oral presentation.
17.03 Participate in group discussion as a member and as a leader.
17.04 Obtain appropriate information form graphics, maps, or signs.
17.05 Prepare visual material to support an oral presentation.
17.06 Demonstrate self-motivation and responsibility to complete an assigned task.
17.07 List the steps in problem solving.
17.08 Choose appropriate action in situations requiring effective time management.
17.09 Identify and discuss issues contained within professional codes of conduct.
17.10 Identify and discuss software licensing issues.
17.11 Identify and discuss property rights and licensing issues.
17.12 Identify and discuss privacy issues.
17.13 Identify and discuss encryption issues.
17.14 Identify legal liability issues.
17.15 Describe appropriate measures for planning and managing a large project.
17.16 Define an implementation schedule for a large project.
17.17 Describe appropriate measures for planning and implementing corporate wide upgrade of hardware and software.

17.18 Identify potential sources of employee/employer or employee/employee conflict and discuss possible approaches to resolve such disagreements.
17.19 Use appropriate communication skills, courtesy, manners, and dress in the workplace.
17.20 Apply principles and techniques for being a productive, contributing member of a team.
17.21 Identify and use acceptable strategies for resolving conflict in the workplace
17.22 Apply principles and techniques for working productively with people of diverse cultures and backgrounds.
17.23 Identify techniques for stress management and prevention of job burn-out.
17.24 Use appropriate communication skills, telephone etiquette, courtesy, and manners when dealing with customers.
17.25 Communicate effectively with individuals lacking a technical background.
17.26 Identify clear detailed technical oral instructions.
17.27 Identify examples of effective end-user training strategies and techniques.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Web Development Specialist**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507.039903
Program Type	College Credit Certificate (CCC)
Program Length	35 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1099.04
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Internet Services Technology AS/AAS degree program (0507.039902).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to Internet, Intranet, and Extranet environments; installing, configuring, designing and managing Intranet and web-based resources.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate proficiency with Internet structure, organization, and navigation.
04.0 Understand, install and configure computer hardware.
05.0 Understand, install and configure computer software.
06.0 Perform enterprise architecture-related tasks.
07.0 Perform web design/development activities.
08.0 Perform programming and scripting activities.
09.0 Perform testing/troubleshooting activities.
10.0 Perform web site management activities.
11.0 Perform e-commerce-related tasks.
14.0 Demonstrate professional development skills.
15.0 Perform Documentation and Technical reference activities.
16.0 Perform general organizational computing workplace competencies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Web Development Specialist**
CIP Number: **0507.039903**
Program Length: **35 credit hours**
SOC Code(s): **15-1099.04**

This certificate program is part of the Internet Services Technology AS/AAS degree program (0507.039902). At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency with Internet structure, organization, and navigation - The student will be able to:

- 01.01 Describe the structure of the Internet.
- 01.02 Define Internet push technologies, such as e-mail marketing vs. Web page banner advertising.
- 01.03 Differentiate among an Intranet site, an Extranet site, and an Internet site.
- 01.04 Describe several major ethical issues related to Internet use.
- 01.05 Identify several legal issues related to Internet use.
- 01.06 Identify several examples to show how the Internet has affected intellectual property rights.
- 01.07 Identify several examples to show how the Internet has affected personal security and privacy.
- 01.08 Demonstrate the use of typical file types and protocols (http:, ftp:, mailto:, gopher:, telnet:, etc.).
- 01.09 Demonstrate the use of typical remote access mechanisms.
- 01.10 Differentiate among all valid WWW file types.
- 01.11 Differentiate among all WWW multimedia file types.
- 01.12 Describe components of URL and their meanings (including types).
- 01.13 Install and configure browser add-ons and plug-ins.

04.0 Understand, install and configure computer hardware - The student will be able to:

- 04.01 Identify various coding schemes (ASCII, etc.).

05.0 Understand, install and configure computer software - The student will be able to:

- 05.01 Describe procedures for uninstalling operating system software.
- 05.02 Install and configure system software.
- 05.03 Install and configure applications software.
- 05.04 Configure software for accessibility by disabled individuals.
- 05.05 Install and configure applications software upgrades.

06.0 Perform enterprise architecture-related tasks – The student will be able to:

- 06.01 Describe the Human-Computer Interaction (HCI) factors that impact the design of a Web page and Web site.
- 06.02 Determine the purpose of establishing an Internet site
- 06.03 Identify the intended audience that will access the Internet site.

06.04 Determine user needs including secondary applications including database needs and select appropriate applications
06.05 Identify business processes to be automated.
06.06 Determine client specifications.
06.07 Determine design standards based on intended audience
06.08 Determine security standards that will meet business requirements.
06.09 Install and configure system based on planning

07.0 Perform web design/development activities – The student will be able to:

07.01 Describe and use the process of storyboarding a Web site.
07.02 Describe format, structure and design principles for Web sites.
07.03 Identify existing resources and constraints.
07.04 Evaluate design based on current industry and in-house standards.
07.05 Create site navigation plan including directory structure.
07.06 Obtain in-house content and determine needs for secondary content providers.
07.07 Design page templates to implement on final site.
07.08 Create a Web page using authoring tools.
07.09 Code page(s) using current Web programming languages.
07.10 Check page for cross-browser capability and other access issues.
07.11 Upload pages and run site analysis.
07.12 Incorporate sound files onto a Web page.
07.13 Incorporate a streaming video file onto a Web page.
07.14 Incorporate a video file for download into a Web page.
07.15 Perform simple graphic modifications using a graphics utility.
07.16 Create virtual Web pages using a virtual reality modeling language.
07.17 Incorporate an e-mail link on a Web page.
07.18 Incorporate internal and external links on a Web page.
07.19 Incorporate frames, tables, and file transfer capabilities on a Web page.
07.20 Incorporate handicapped-accessibility options into the Web site.
07.21 Create a Web form and produce e-mail results.
07.22 Create a Web database interface.
07.23 Discuss the issue of ODBC compliance.

08.0 Perform programming and scripting activities – The student will be able to:

08.01 Identify several of the most prominent current programming languages.
08.02 Characterize the stages of the system development life cycle.
08.03 Differentiate between structured programming and object-oriented programming.
08.04 Use procedural and object-oriented constructs of programming, scripting, and/or macro languages to create and test programs including batch files and menu programs.
08.05 Apply principles of good design and documentation when developing programs.
08.06 Write scripting code to handle error checking in client forms.
08.07 Write CGI programs to allow for interactions between the client and server.
08.08 Write Java applets.
08.09 Identify development tools and list in order of complexity of use.
08.10 Review design specifications.
08.11 Design and test algorithms.
08.12 Write program according to specs.
08.13 Test and debug code.

08.14 Revise code based on testing procedures

09.0 Perform testing/troubleshooting activities – The student will be able to:

09.01 Locate and use online documentation resources.
09.02 Describe effective troubleshooting strategies and techniques to resolve basic hardware, software, and network problems.
09.03 Recognize and resolve basic hardware, software configuration, and peripheral device problems.
09.04 Describe handicapped-accessibility features for a Web site.
09.05 Describe appropriate security procedures and practices, including physical security and protection of resources through software measures (passwords, antivirus software, data encryption, etc.).
09.06 Revise system as required.

10.0 Perform web site management activities - The student will be able to:

10.01 Install and configure Web site management software.
10.02 Implement appropriate Web site security measures.

11.0 Perform e-commerce-related tasks – The student will be able to:

11.01 Describe Web e-commerce.
11.02 Analyze e-commerce models.
11.03 Develop an e-commerce business plan.

14.0 Demonstrate professional development skills – The student will be able to:

14.01 Identify corporate strategies and policies.
14.02 Anticipate future industry trends.
14.03 Continue education.
14.04 Review and analyze other industry productions.
14.05 Use and experiment with the technology.

15.0 Perform documentation and technical reference activities– The student will be able to:

15.01 Use technical vocabulary appropriately.
15.02 Locate information in technical references.
15.03 Describe appropriate documentation procedures and practices.
15.04 Effectively use locally maintained systems, software, and network documentation.
15.05 Produce and maintain system documentation, such as inventory, costs, installed software, and procedures.
15.06 Perform Documentation and Technical reference activities.
15.07 Understand, Install and configure computer software
15.08 Perform Troubleshooting activities.
15.09 Demonstrate understanding of networked environments.
15.10 Demonstrate proficiency with Internet structure, organization, and navigation.
15.11 Locate technical information online.
15.12 Evaluate information located through online research.

16.0 Perform general organizational computing workplace competencies – The student will be able to:

16.01 Follow oral and written instructions.
16.02 Prepare, outline, and deliver a short oral presentation.
16.03 Participate in group discussion as a member and as a leader.
16.04 Obtain appropriate information form graphics, maps, or signs.
16.05 Prepare visual material to support an oral presentation.
16.06 Demonstrate self-motivation and responsibility to complete an assigned task.
16.07 Choose appropriate action in situations requiring effective time management.
16.08 Identify and discuss software licensing issues.
16.09 Identify and discuss property rights and licensing issues.
16.10 Identify and discuss privacy issues.
16.11 Identify and discuss encryption issues.
16.12 Identify legal liability issues.
16.13 Apply principles and techniques for being a productive, contributing member of a team.
16.14 Identify and use acceptable strategies for resolving conflict in the workplace
16.15 Apply principles and techniques for working productively with people of diverse cultures and backgrounds.
16.16 Communicate effectively with individuals lacking a technical background.
16.17 Identify clear detailed technical oral instructions.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Information Technology Administration**
Career Cluster: **Information Technology**

CCC	
CIP Number	0507.039904
Program Type	College Credit Certificate (CCC)
Program Length	18 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	11-3021
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Internet Services Technology AS/AAS degree program (0507.039902).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to Internet, Intranet, and Extranet environments; installing and configuring Intranet and web-based resources.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate proficiency with Internet structure, organization, and navigation
02.0 Demonstrate understanding of networked environments, hardware and software
03.0 Understand, install and configure computer hardware
04.0 Understand, install and configure computer software
05.0 Perform web design/development activities.
06.0 Perform web site management activities
07.0 Perform e-commerce-related tasks.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Information Technology Administration**
CIP Number: **0507.039904**
Program Length: **18 credit hours**
SOC Code(s): **11-3021**

This certificate program is part of the Internet Services Technology AS/AAS degree program (0507.039902). At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency with internet structure, organization, and navigation - The student will be able to:

- 01.01 Describe the origin of the Internet.
- 01.02 Outline the history of the Internet.
- 01.03 Describe Internet organization, such as the Internic, domains and requests for comments (RFCs).
- 01.04 Describe the structure of the Internet.
- 01.05 Differentiate between the Internet and the WWW.
- 01.06 Define Internet push technologies, such as e-mail marketing vs. Web page banner advertising.
- 01.07 Differentiate among an Intranet site, an extranet site, and an Internet site.
- 01.08 Characterize the role of the Internet in today's society.
- 01.09 Describe several major ethical issues related to Internet use.
- 01.10 Identify several legal issues related to Internet use.
- 01.11 Identify several examples to show how the Internet has affected intellectual property rights.
- 01.12 Identify several examples to show how the Internet has affected personal security and privacy.
- 01.13 Describe the World Wide Web (WWW).
- 01.14 Provide several examples to show how the WWW has affected our society.
- 01.15 Demonstrate the use of typical file types and protocols (http:, ftp:, mailto:, gopher:, telnet:, etc.).
- 01.16 Demonstrate the use of typical remote access mechanisms.
- 01.17 Differentiate among all valid WWW file types.
- 01.18 Differentiate among all WWW multimedia file types.
- 01.19 Describe components of URL and their meanings (including types).
- 01.20 Effectively use Internet tools and utilities such as e-mail, browsers, search engines, news groups, list serves, chat rooms, file transfers.
- 01.21 Install and configure an Internet browser.
- 01.22 Install and configure browser add-ons and plug-ins.
- 01.23 Install and configure a newsgroup reader.
- 01.24 Install and configure a chat group client.

02.0 Demonstrate understanding of networked environments, hardware, and software - The student will be able to:

- 02.01 Give several advantages and disadvantages of networked and non-networked environments.

02.02 Describe current network environments, such as peer-to-peer and client/server.
02.03 Identify and discuss issues (such as security, privacy, redundancy, etc.) related to networked environments.
02.04 Identify and discuss issues related to naming conventions for user-ids, e-mail, passwords, and network devices.
02.05 List and define layers in the OSI and TCP/IP network protocol models.
02.06 Identify and describe current relevant IEEE network standards.
02.07 Illustrate typical network topologies.
02.08 Identify advantages and disadvantages of each topology.
02.09 Describe the major functions of LAN hardware protocols such as Ethernet, token ring, FDDI, and arcnet.
02.10 Describe LAN software protocols such as IPX/SPX, TCP/IP, and NetBEUI.
02.11 Discuss the nature of IP addresses and MAC addresses, and mapping between protocol addressing schemes.
02.12 Describe the major functions of network server hardware and software components.
02.13 Describe server hardware requirements.
02.14 Describe the hardware needed for hosting a Web site.
02.15 Identify a variety of specialized servers (e.g. proxy, e-mail, DHCP, Web, etc.)
02.16 Describe the hardware requirements for specialized servers (such as e-mail, database).
02.17 Describe the major functions of network client hardware components.
02.18 Describe client hardware requirements.
02.19 Differentiate between hardware used to implement different topologies such as token ring and Ethernet.
02.20 Recognize and describe current cable technologies such as twisted-pair, coaxial, and fiber optic, and identifying issues associated with plenum verses non-plenum cable plants.
02.21 Describe current wireless technologies such as satellite, microwave, spread spectrum RF, and infrared.
02.22 Identify advantages and disadvantages of wireless and cable technologies.
02.23 Cite appropriate uses of wireless and cable technologies.
02.24 Describe the major functions of network connectivity hardware, such as hubs, repeaters, bridges, routers, switches, and gateways.
02.25 Describe the hardware needed to connect a LAN to the Internet.
02.26 Describe the function of network storage devices and other peripherals (RAID, CD towers, printers, fax machines, scanners, printer/fax/copiers, imaging devices, and document center equipment, etc.).
02.27 Compare and contrast major functions and features of current network operating systems (including directory services).
02.28 Differentiate between telecommunications and data communications.
02.29 Compare and contrast digital communications lines and cable characteristics (e.g. ISDN, DSL, T-1 and T-3).

03.0 Understand, install and configure computer hardware - The student will be able to:

03.01 Explain the use of binary numbers to represent instructions and data.
03.02 Describe the hardware implications of the use of binary representation of instructions and data.
03.03 Convert numbers among decimal, binary, and hexadecimal representation.

03.04 Perform binary arithmetic.
03.05 Identify various coding schemes (ASCII, etc.).
03.06 Discuss various data types (signed and unsigned integers, floating point, etc
03.07 Identify the major hardware platforms
03.08 Describe distinguishing features of the major hardware platforms
03.09 Describe the functions of major hardware components of a computer system
03.10 Recognize and correctly identify computing hardware components.
03.11 Describe emerging hardware technologies and discuss their potential impact
03.12 Implement proper procedures for handling and safeguarding equipment.
03.13 Perform preventive maintenance tasks on microcomputer systems.
03.14 Describe procedures for proper disposal of computer components.
03.15 Set up and configure systems and peripherals.
03.16 Set up BIOS.
03.17 Install and configure storage and I/O device interfaces.
03.18 Install and configure multimedia devices and interfaces.
03.19 Install and configure network interface cards.

04.0 Understand, install and configure computer software - The student will be able to:

04.01 Describe the functions and major components (BIOS, task management, etc.) of a computer operating system.
04.02 Identify current operating systems and describe their important features.
04.03 Use an operating system for activities such as data and file management.
04.04 Identify current systems utilities and describe their functions.
04.05 Use system software to perform routine maintenance tasks such as backup, hard drive defragmentation, etc.
04.06 Use operating systems of different brands and platforms.
04.07 Use both stand-alone operating systems and network operating systems.
04.08 Create, use, and maintain system configuration files.
04.09 Describe the major features and functions of the major categories of applications software (word processing, database, spreadsheet, presentation, e-mail, browsers, etc.).
04.10 Use basic features of office productivity software.
04.11 Learn to perform independently (previously untaught) tasks using office productivity software.
04.12 Use software produced by multiple vendors.
04.13 Transmit and exchange data in a multiple vendor software environment.
04.14 Install and configure a microcomputer operating system.
04.15 Describe procedures for uninstalling operating system software.
04.16 Install and configure system software.
04.17 Install and configure applications software.
04.18 Configure software for accessibility by disabled individuals.
04.19 Install and configure applications software upgrades.
04.20 Describe modifications necessary to an operating system (such as modifying parameters, how to handle conflicting interrupts, etc.) when installing, configuring and upgrading typical applications software.
04.21 Install and configure client software for connecting to LANs, WANs, and the Internet (network client, WWW browser, terminal emulation, file transfer, etc.).
04.22 Install and configure client software for client/server and network-based applications (e-mail, videoconferencing, database, etc.).
04.23 Install internetworking applications on a server and configure clients for network

access.

04.24 Describe the major functions of network client software components.
04.25 Install and configure client software on multiple hardware platforms.
04.26 Install and configure drivers for NICs and network peripherals (including printers).
04.27 Configure the client to support multiple protocols.
04.28 Install and configure client/server applications (such as e-mail, scheduling, etc) on a server.
04.29 Install and configure network-based services such as videoconferencing, integrated voicemail/email/fax, large document storage and retrieval, etc.

05.0 Perform web design/development activities – The student will be able to:

05.01 Create a Web database interface.
05.02 Discuss the issue of ODBC compliance.

06.0 Perform web site management activities - The student will be able to:

06.01 Describe the process of obtaining an Internet domain address.
06.02 Register an Internet site.
06.03 Notify appropriate external search engines of the Web site.
06.04 Compare features of currently available site management tools.
06.05 Install and configure Web site management software.
06.06 Create and maintain a Web site using a Web management tool.
06.07 Implement appropriate Web site security measures.
06.08 Use and evaluate the results of a Web site visit-recording tool.

07.0 Perform e-commerce-related tasks – The student will be able to:

07.01 Describe Web e-commerce.
07.02 Analyze e-commerce models.
07.03 Develop an e-commerce business plan.
07.04 Develop e-commerce marketing plan.
07.05 Identify components and procedures necessary to process credit card transactions
07.06 Integrate credit card transaction process.
07.07 Implement shopping cart software.
07.08 Set up and configure online catalog to market products.
07.09 Establish transaction storage and reporting system
07.10 Publish web site.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Business Intelligence Specialist**
Career Cluster: **Information Technology**

	AS	AAS
CIP Number	1511010300	0511010300
Program Type	College Credit	College Credit
Standard Length	63 Credit Hours	63 Credit Hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes	15-1099.10	15-1099.10
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupationally-specific skills relating to the field of business intelligence analysis.

The content includes but is not limited to in-depth instruction on the activities performed during the life cycle of business intelligence analysis; factors, issues, and constraints relating to the creation of business intelligence reports; requirements for documenting specifications; identifying data sources and retrieval issues and methodologies; report delivery mechanisms; report modification and maintenance; data governance; quality control tests; data and report integrity; and the use of business intelligence tools.

Program Structure

This program is a planned sequence of instruction consisting of 63 credit hours.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda (PBL) and Business Professionals of America (BPA) are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Articulation

To be transferable statewide between institutions, this program must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific articulation agreements with each other.

Program Length

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. The standard length of this program is 63 credit hours according to Rule 6A-14.030, F.A.C.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Describe the life cycle of business intelligence analysis.
02.0 Describe business intelligence analysis.
03.0 Describe the implications of business intelligence analysis on an organization's strategic marketing, organizational, and business plans.
04.0 Document specifications for and generate standard or custom reports, that summarize business, financial, or economic data for review by executives, managers, clients, and other stakeholders.

05.0 Define and differentiate among data constraints, filters, exception threshold, and data organization factors important in the creation of a report.
06.0 Locate, acquire, and model the data for analysis and output.
07.0 Compare and contrast the various forms for report presentation.
08.0 Describe the advantages and disadvantages for various report delivery mechanisms.
09.0 Reassess current business intelligence or trend data in support of altered information needs.
10.0 Analyze technology trends to identify markets for future product development or to improve sales of existing products.
11.0 Conduct or coordinate tests to ensure that intelligence is consistent with defined needs.
12.0 Formulate and/or adhere to data governance policies and processes.
13.0 Identify and analyze industry or geographic trends with business strategy implications.
14.0 Adhere to best practices for change management to ensure data and report integrity and continuity.
15.0 Apply quality control standards and measures.
16.0 Compare and contrast the attributes and appropriateness of business intelligence tools.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Business Intelligence Specialist**
CIP Numbers: **15110100300 AS, 0511010300 AAS**
Program Length: **63 Credit Hours**
SOC Code(s): **15-1099.10**

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. At the completion of this program, the student will be able to:

01.0 Describe the life cycle of business intelligence analysis.

- 01.01 Describe the activities and goals of the analysis planning and justification phase.
  - 01.01.01 Define the goals of the desired analysis.
  - 01.01.02 Select appropriate analysis strategy according to key performance indicators.
  - 01.01.03 Determine data parameters and metrics.
  - 01.01.04 Determine data requirements.
- 01.02 Describe the activities and goals of the design phase.
  - 01.02.01 Determine appropriate reporting format.
  - 01.02.02 Determine appropriate delivery mechanism.
  - 01.02.03 Define data criteria and constraints.
  - 01.02.04 Delineate report data definitions.
  - 01.02.05 Select appropriate reporting tool/form.
- 01.03 Describe the activities and goals of the development phase.
  - 01.03.01 Identify available data sources and formats.
  - 01.03.02 Acquire data.
  - 01.03.03 Create report.
- 01.04 Describe the activities and goals of the evaluation phase.
  - 01.04.01 Define analytics/metrics suitable for evaluating accuracy and validity of results.
  - 01.04.02 Evaluate report output to assess whether intelligence is consistent with define goals.
  - 01.04.03 Assess report performance and usability.
- 01.05 Describe the activities and goals of the deployment and maintenance phase.
  - 01.05.01 Perform data reconciliation.
  - 01.05.02 Conduct periodic validation of reports with appropriate audiences and end-users.
  - 01.05.03 Track daily/weekly/monthly usage of data/reports.
  - 01.05.04 Determine proper “phasing out” thresholds for existing reports based on usage, data validity, and report reliability.
  - 01.05.05 Determine proper data archiving thresholds.

02.0 Describe business intelligence analysis.

- 02.01 Define the role of business intelligence analysis in the decision-making process.
- 02.02 Describe the categories of business intelligence reports.

02.03 Describe the sources of data and information used in the creation of business intelligence reports.
02.04 Explain the role and significance of OLAP, analytics, and data mining to the conduct of business intelligence analysis.
02.05 Describe risks/pitfalls associated with business intelligence analysis (e.g., data validity, integrity, inappropriate analytics/metrics, et al.).

03.0 Describe the implications of business intelligence analysis on an organization's strategic marketing, organizational, and business plans.

03.01 Explain how business intelligence is used in creating, validating, and strengthening an organization's strategic marketing plan.
03.02 Explain how an organization's internal processes, infrastructure, processes, and communication are impacted by the deployment of business intelligence.
03.03 Explain how business intelligence is used to facilitate an organization's decision-making process.

04.0 Document specifications for and generate standard or custom reports, that summarize business, financial, or economic data for review by executives, managers, clients, and other stakeholders.

04.01 Compare attributes and benefits of available data sources.
- 04.01.01 RDMS
- 04.01.02 OLAP Cubes
- 04.01.03 Spreadsheet
- 04.01.04 XML
- 04.01.05 CSV
- 04.01.06 Web service

04.02 Defining report data elements/requirements (metadata).
- 04.02.01 Dimensions
- 04.02.02 Type I (As is – current)
- 04.02.03 Type II (Historical – slowly changing)
- 04.02.04 Facts
- 04.02.05 Base
- 04.02.06 Summaries
- 04.02.07 Calculated fields
- 04.02.08 Periodicity
- 04.02.09 Relationships/JOINs

04.03 Describe how data is to be used and retained (disposition).
- 04.03.01 Data mining
- 04.03.02 Filtering
- 04.03.03 Exception threshold alerts
- 04.03.04 Aggregating
- 04.03.05 Snapshot
- 04.03.06 Dynamic
- 04.03.07 Historical/archive/disposal

04.04 Determine the form of analysis.
- 04.04.01 Comparative analysis
- 04.04.02 Impact analysis
- 04.04.03 Correlational (affinity) analysis
- 04.04.04 Trending/Forecasting

05.0 Define and differentiate among data constraints, filters, exception threshold, and data organization factors important in the creation of a report.

- 05.01 Distinguish between data constraints and filters and their appropriate use.
- 05.02 Describe how each of the following data constraints relates to the creation and/or delivery of a report.
  - 05.02.01 Size of recordset (scope & performance)
  - 05.02.02 Time/period (end points and span)
  - 05.02.03 Range (e.g., # of records)
  - 05.02.04 Data element (e.g., type, size)
  - 05.02.05 Localization (programming & display language)
- 05.03 Describe how each of the following types of filters may be used to refine or enhance a report.
  - 05.03.01 Dimensions (Type I and Type II)
  - 05.03.02 Facts (e.g., base, summaries, calculated fields)
- 05.04 Illustrate how the use of an exception threshold contributes to the operational effectiveness of a report.
  - 05.04.01 Display or action dependent on threshold
  - 05.04.02 Triggers alert or advance warning of approaching static threshold
  - 05.04.03 Highlights results exceeding dynamic threshold
- 05.05 Compare and contrast the following forms of data organization in terms of representation and analysis of data results.
  - 05.05.01 GROUP BY
  - 05.05.02 ORDER BY (SORT)
  - 05.05.03 Concatenation/substring
  - 05.05.04 RANK

06.0 Locate, acquire, and model the data for analysis and output.

- 06.01 Identify the types of data that might be used to create business intelligence reports in support of the organization's business and financial strategic goals.
  - 06.01.01 Inventory repositories
  - 06.01.02 Sales data
  - 06.01.03 Customer data
  - 06.01.04 Employee/staffing data
  - 06.01.05 Financial data
- 06.02 Describe the risks and potential areas of concern related to the use of external data.
  - 06.02.01 Integrity/validity of data.
  - 06.02.02 Legality of data availability.
  - 06.02.03 Privacy issues of data acquired.
  - 06.02.04 Confidentiality of acquisition.
- 06.03 Describe potential issues, concerns, and obstacles associated with the use of data sources.
  - 06.03.01 Data form
  - 06.03.02 Data integrity
  - 06.03.03 Normalization
- 06.04 Describe the role and implications of standardization relative to internal and external data sources.
  - 06.04.01 Describe the need for data typing and transformation.

06.04.02 Describe the methods by which transformation may be accomplished.

07.0 Compare and contrast the various forms for report presentation.

07.01 Describe the attributes of a report suitable for creation using a report generator.
07.02 Describe the attributes of a report suitable for presentation in spreadsheet form.
07.03 Describe the attributes of a report suitable for presentation in database form.
07.04 Describe the attributes of a report suitable for presentation in OLAP Cube or hypercube form.
07.05 Describe the attributes of a report suitable for presentation in HTML/Flash.
07.06 Describe the attributes of a report suitable for presentation in graph form.
07.07 Describe the attributes of a report suitable for presentation via a dashboard interface.

08.0 Describe the advantages and disadvantages for various report delivery mechanisms.

08.01 Email
08.02 Web-based
08.03 Mobile device
08.04 Intranet
08.05 Print/PDF
08.06 Oral presentation

09.0 Reassess current business intelligence or trend data in support of altered information needs.

09.01 Identify and relate report design constraints and their relationship to data.
09.02 Evaluate current technology in terms of compatibility and capacity for meeting new or evolving information needs.
09.03 Re-construct report based on alternative parameters.
09.04 Adapt and validate report based on new requirements.

10.0 Analyze technology trends to identify markets for future product development or to improve sales of existing products.

10.01 Evaluate new technologies and products for applicability, capability, and capacity for current and future information needs.
10.02 Create a proposal for introducing new, or adapting existing, business intelligence technology, including pricing, benefits summary, cost/benefit analysis, life cycle implications, and implementation plan.

11.0 Conduct or coordinate tests to ensure that intelligence is consistent with defined needs.

11.01 Reports meet requirements
11.02 Testing metrics for accuracy and validity
11.03 Peer review
11.04 Performance testing
11.05 Performance tuning

12.0 Formulate and/or adhere to data governance policies and processes.

12.01 Understand how information is disseminated to end-users
12.02 Adhere to policies, tool use, and processes related to data governance.

13.0 Identify and analyze industry or geographic trends with business strategy implications.

13.01 Compare and contrast key performance indicators appropriate to the industry
13.02 Define metrics to support analysis of targeted KPIs.
13.03 Understand how the monitoring and analysis of key performance indicators strengthen or support the organization's goals and strategies.

14.0 Adhere to best practices for change management to ensure data and report integrity and continuity.

14.01 Authorization/permissions schema
14.02 Internal controls
14.03 Impact analysis
14.04 Redundancy/archival policy
14.05 Assessing readiness for change
14.06 Communication of changes
14.07 Separation of duties (e.g., design, implementation, testing)

15.0 Apply quality control standards and measures.

15.01 Data quality
15.02 Report quality
15.03 Analytic/metric quality
15.04 Quality assurance checks

16.0 Compare and contrast the attributes and appropriateness of business intelligence tools.

16.01 Compare and contrast enterprise-based/integrated business intelligence tools, including SAS, SAP, and COGNOS.
16.02 Compare and contrast native/client-based tools used in business intelligence analysis, including spreadsheets and SQL-compliant applications.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Computer Engineering Technology**
Career Cluster: **Information Technology**

	AS	AAS
CIP Number	1615.040200	0615.040200
Program Type	College Credit	College Credit
Standard Length	68 credit hours	68 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)	Phi Beta Lambda, BPA(Business Professionals of America)
SOC Codes (all applicable)	15-1099.02	15-1099.02
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as computer engineering technicians and in related occupations in electronics in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to computer systems architecture, software, communications, programming and analysis and design of computer systems.

Electronic Technology and/or Electronic Engineering Technology (CORE) are prerequisites for entry into this electronic specialization program. The CORE program prepares individuals to assemble, install, operate, maintain, troubleshoot and repair electronic equipment used in industry. In addition, it also includes content related to the design, theory, and analysis of electronic systems and applications.

Program Structure

This program is a planned sequence of instruction consisting of 68 hours.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and Business Professionals of America are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Program Length

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. The standard length of this program is 68 credit hours according to Rule 6A-14.030, F.A.C.

Certificate Programs

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).This AS/AAS degree program includes the following College Credit Certificates:

Cisco Certified Network Associate (0615.040201) – 12 credit hours
Microcomputer Repairer/Installer (0615.040202) – 15 credit hours
Computer Specialist (0615.040203) – 27 credit hours
Network Systems Developer (0615.040204) – 41 credit hours
Wireless and IP Communications Technician (0615.040205) – 15 credit hours

Standards for the above certificate programs are contained in separate curriculum frameworks.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Demonstrate proficiency in computer systems architecture.
02.0 Demonstrate proficiency in software fundamentals.
03.0 Demonstrate proficiency in communication interfacing.
04.0 Demonstrate proficiency in peripheral equipment.
05.0 Demonstrate proficiency in customer site requirements and considerations.
06.0 Demonstrate proficiency in customer relations.
07.0 Demonstrate proficiency with high-level computer programming languages.
08.0 Demonstrate proficiency in computer networking techniques.
09.0 Demonstrate proficiency in the use of microcomputer disk operating system services and functions.
10.0 Demonstrate proficiency in analysis and design of data communications systems.
11.0 Demonstrate proficiency in the analysis and design of peripheral equipment used in computer systems.
12.0 Demonstrate appropriate communication skills.
13.0 Demonstrate appropriate math skills.
14.0 Demonstrate appropriate understanding of basic science.
15.0 Demonstrate employability skills.
16.0 Demonstrate an understanding of entrepreneurship.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Computer Engineering Technology**
CIP Numbers: **1615. 040200 AS, 0615.040200 AAS**
Program Length: **68 credit hours**
SOC Code(s): **15-1099.02**

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency in computer systems architecture--The student will be able to:

01.01 Draw and explain systems configurations in block detail.
01.02 Interpret computer acronyms.
01.03 Identify and define priorities and interrupts at system level.
01.04 Define and list direct memory access handling systems.
01.05 Define functions of advanced memory techniques (e.g. virtual, pipeline, cache).
01.06 Troubleshoot a microcomputer system.

02.0 Demonstrate proficiency in software fundamentals--The student will be able to:

02.01 Load and run operating system software.
02.02 Load and run diagnostic software and utilities.
02.03 Construct flow charts.
02.04 Analyze flow charts.
02.05 Identify and define computer languages and their uses.
02.06 Write a simple computer program in BASIC.
02.07 Read a PROM.
02.08 Erase and program an EPROM.
02.09 Analyze firmware concepts.
02.10 Troubleshoot firmware using defined hardware.
02.11 Analyze firmware writing concepts.

03.0 Demonstrate proficiency in communication interfacing--The student will be able to:

03.01 Identify and define serial and parallel interface standards.
03.02 Identify, define and configure sync and async devices.
03.03 Demonstrate the use of interface devices.
03.04 Identify and define networking levels.
03.05 Identify and define protocols.
03.06 Troubleshoot and repair network systems.
03.07 Identify and define multi-user systems.

04.0 Demonstrate proficiency in peripheral equipment--The student will be able to:

04.01 Install, analyze and troubleshoot interface controllers.
04.02 Install, analyze and troubleshoot display terminals.

04.03 Install, analyze and troubleshoot printer.
04.04 Install, analyze and troubleshoot magnetic tape equipment.
04.05 Install, analyze and troubleshoot disk drive equipment.
04.06 Define environmental requirements for peripherals and media.

05.0 Demonstrate proficiency in customer site requirements and considerations--The student will be able to:

05.01 Apply effective customer relations.
05.02 Follow installation procedures.
05.03 Calculate and determine power requirements.
05.04 Calculate and determine environmental requirements.
05.05 List and perform preventative maintenance techniques and requirements.

06.0 Demonstrate proficiency in customer relations--The student will be able to:

06.01 Describe effective listening techniques.
06.02 Describe techniques for instilling customer confidence.
06.03 Describe techniques for keeping the customer informed.
06.04 Demonstrate proper follow-up techniques.

07.0 Demonstrate proficiency with high-level computer programming languages--The student will be able to:

07.01 Write a technical program in a high-level programming language (e.g. Fortran, Cobol, Basic, C) and associated system level concepts.
07.02 Identify and define associated system level concepts.
07.03 Apply structured programming such as loop structures, sorting techniques, data structures and arithmetic operations.

08.0 Demonstrate proficiency in computer networking techniques--The student will be able to:

08.01 Identify and define computer networking techniques.
08.02 Design a system using hardware and software communication protocols.
08.03 Apply management techniques for network software.

09.0 Demonstrate proficiency in the use of microcomputer disk operating system services and functions--The student will be able to:

09.01 Describe the historical development of computer operating systems.
09.02 Describe the major hardware and related software subsystems of microcomputer DOS (Disk Operating System).
09.03 Describe various disk formats.
09.04 Program using assembly language to access the ROM-BIOS (Read-Only Memory-Basic Input/Output System) feature for peripheral control and serial communications.
09.05 Describe the extended services of enhanced systems.
09.06 Describe design decisions involved in implementing Input/Output (I/O) interfacing using interrupts.
09.07 Program using assembly language to implement I/O device interfacing using interrupts.

09.08 Program using the extended DOS functions.
09.09 Analyze and design software systems using ROM-BIOS, DOS functions and interrupts for use in a multiplexed analog to digital system.
09.10 Analyze and design software systems using ROM-BIOS functions and interrupts for use in a synchronous digital data system.

10.0 Demonstrate proficiency in analysis and design of data communications systems--The student will be able to:

10.01 Describe the different types of digital data communications systems.
10.02 Describe data formats and transmission rates in serial data communications systems.
10.03 Design the connections and programming for a UART (Universal Asynchronous/Synchronous Receiver Transmitter) in a microprocessor-based system.
10.04 Identify and define available options for integration of a display terminal in a data communication system.
10.05 Identify and define communication signals and protocol for MODEM (Modulator Demodulator) links.
10.06 Apply digital modulation techniques including PAM (Pulse-Amplitude Modulation), PCM (Pulse-Code Modulation), PWM (Pulse-Width Modulation) and delta modulation.
10.07 Analyze and design circuits for generation and detection of digital modulation.
10.08 Apply error detection and correction in digital communication systems.
10.09 Define communication protocols.
10.10 Design and apply multiplexing techniques for computer.

11.0 Demonstrate proficiency in the analysis and design of peripheral equipment used in computer systems--The student will be able to:

11.01 Design and analyze circuits used in various functions of video display systems.
11.02 Analyze various types of disk drives and disk drive controllers.
11.03 Analyze various types of printers and plotters and their related interface controllers.
11.04 Analyze and design circuits for sweep generation and synchronization in a CRT (Cathode-Ray Tube) display.
11.05 Describe the use of RAM (Random-Access Memory) and ROM (Read-Only Memory) for font generation in video display systems.
11.06 Design the serial communication interface in a video.
11.07 Modulation and interval timing techniques.
11.08 Pointing devices for computer systems.
11.09 Analyze the operation of mechanical and optical pointing devices used in computer systems.
11.10 Describe the functions of the major blocks in a dot matrix printer.
11.11 Analyze and design circuits to communicate using a standard Centronics parallel interface in a printer.
11.12 Describe the main functional blocks of a roller bed plotter.
11.13 Analyze and design subsystems including interfaces for use in a roller bed plotter.

12.0 Demonstrate appropriate communication skills--The student will be able to:

12.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
12.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
12.03 Read and follow written and oral instructions.
12.04 Answer and ask questions coherently and concisely.
12.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
12.06 Demonstrate appropriate telephone/communication skills.

13.0 Demonstrate appropriate math skills--The student will be able to:

13.01 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
13.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
13.03 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
13.05 Demonstrate an understanding of federal, state and local taxes and their computation.

14.0 Demonstrate appropriate understanding of basic science--The student will be able to:

14.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
14.02 Draw conclusions or make inferences from data.
14.03 Identify health related problems which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
14.04 Understand pressure measurement in terms of P.S.I., inches of mercury, and K.P.A.

15.0 Demonstrate employability skills--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents which may be required when applying for a job interview.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor or other employees.
15.07 Identify acceptable work habits.
15.08 Demonstrate knowledge of how to make appropriate job changes.
15.09 Demonstrate acceptable employee health habits.
15.10 Demonstrate a knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

16.0 Demonstrate an understanding of entrepreneurship--The student will be able to:

16.01 Identify characteristics of the American enterprise system.
16.02 Define inflation and deflation.
16.03 Illustrate the basic economic questions facing any society.
16.04 Determine the results of a change in demand or a change in supply.
16.05 List factors which contribute to economic growth.
16.06 Identify characteristics of different types of business ownership.
16.07 Choose appropriate action in a situation requiring application of business ethics.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Cisco Certified Network Associate Certificate**
Career Cluster: **Information Technology**

CCC	
CIP Number	0615.040201
Program Type	College Credit Certificate (CCC)
Program Length	12 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1081
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Computer Engineering Technology AS/AAS degree program (0615.040200).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to the selection of telecommunications equipment, including the installation and configuration of networks, routers, and switches.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA is the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate proficiency in network design.
02.0 Demonstrate proficiency in hubs, routers, and switches.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Cisco Certified Network Associate Certificate**
CIP Number: **0615.040201**
Program Length: **12 Credit Hours**
SOC Code(s): **15-1081**

This certificate program is part of the Computer Engineering Technology AS/AAS degree program (0615.040200). At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency in network design**--**The student will be able to:

01.01 Explain the OSI model for LAN and WAN communications.
01.02 Apply the OSI model to realistic networking situations.
01.03 Describe the basic LAN topologies and transport methods.
01.04 Explain basic WAN topologies and transport methods.
01.05 Describe the various functions of the principle networking standards organizations.
01.06 Describe various kinds of network media.
01.07 Compare packet and cell implementations and interfaces.
01.08 Explain WAN carrier types for point-to-point, T-carriers, SONET, ISDN, and wireless technologies.
01.09 Describe the purpose of LAN network transmission equipment, including NICs, repeaters, MAUs, hubs, routers, switches, and gateways.
01.10 Explain how LAN network equipment works.
01.11 Describe the purpose of WAN network equipment, including multiplexers, channel banks, private networks, modems, access servers, and routers.
01.12 Explain how WAN network equipment works.
01.13 Design LAN topologies using media and equipment for different kinds of applications.
01.14 Design a LAN to connect to a WAN.
01.15 Discuss WAN topology options according to pricing, bandwidth needs, and equipment needs.
01.16 Explain how video and audio are transported over networks.
01.17 Discuss voice, video, and data transmitted works.
01.18 Explain how multimedia data transmission works.
01.19 Design LANs and WANs for integrated voice, video, and data transmissions.
01.20 Describe TCP/IP.
01.21 Explain how TCP and IP are implemented on networks.
01.22 Explain how UDP is employed with IP.
01.23 Describe IP addressing and understand how to use it on LANs and WANs.
01.24 Describe the new IP version 6 and understand how to design it into your expanding network.
01.25 Discuss and use application protocols in the TCP/IP suite.
01.26 Explain WAN Transport Methods – X.25, Frame Relay, ISDN, SMDS, DSL, and SONET.
01.27 Explain ATM Technologies – Characteristics, Layered Communications, and Cell structure.
01.28 Explain ATM design considerations.

01.29 Describe ATM topologies.
01.30 Explain ATM backbone networks.
01.31 Describe ATM LAN applications.
01.32 Describe advantages and disadvantages of Network Protocol Architectures.

02.0 Demonstrate proficiency in hubs, routers, and switches**--**The student will be able to:

02.01 Identify standalone hubs
02.02 Discuss the differences between stackable, modular, and intelligent hubs.
02.03 Explain how to install a hub.
02.04 Identify how to choose the right hub.
02.05 Describe the advantage of segmentation.
02.06 Describe segmentation using bridges, switches, and routers.
02.07 Name and describe switching methods.
02.08 Describe network congestion problems in Ethernet networks.
02.09 Describe the benefits of network segmentation with bridges, switches, and routers.
02.10 Distinguish between cut-through and store-and-forward LAN switching.
02.11 Describe the operation of the Spanning Tree Protocol and its benefits.
02.12 Describe the benefits of virtual LANs.
02.13 Identify RIP and IGRP routing protocols.
02.14 Explain the services of separate and integrated multi-protocol routing.
02.15 Identify routing problems.
02.16 Identify router features and functions.
02.17 Describe the features and functions of gateways.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Microcomputer Repairer/Installer**
Career Cluster: **Information Technology**

CCC	
CIP Number	0615.040202
Program Type	College Credit Certificate (CCC)
Program Length	15 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1041
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Computer Engineering Technology AS/AAS degree program (0615.040200).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to the study of computer systems architecture.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate proficiency in computer systems architecture.
02.0 Demonstrate proficiency in the use of microcomputer disk operating system services and functions.
03.0 Demonstrate proficiency in computer operating systems.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Microcomputer Repairer/Installer**
CIP Number: **0615.040202**
Program Length: **15 credit hours**
SOC Code(s): **15-1041**

This certificate program is part of the Computer Engineering Technology AS/AAS degree program (0615.040200). At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency in computer systems architecture—The student will be able to:

- 01.01 Draw and explain systems configurations in block detail.
- 01.02 Interpret computer acronyms.
- 01.03 Identify and define priorities and interrupts at system level.
- 01.04 Define and list direct memory access handling systems.
- 01.05 Define functions of advanced memory techniques (e.g. virtual, pipeline, cache).
- 01.06 Troubleshoot a microcomputer system.

02.0 Demonstrate proficiency in the use of microcomputer disk operating system services and functions--The student will be able to:

- 02.01 Describe the historical development of computer operating systems.
- 02.02 Describe the major hardware and related software subsystem of microcomputer DOS (Disk Operating System).
- 02.03 Describe various disk formats.
- 02.04 Describe the extended services of enhanced systems.
- 02.05 Describe design decisions involved in implementing Input/Output (I/O) interfacing using interrupts.
- 02.06 Program using the extended DOS functions.
- 02.07 Describe the various operating systems, including Windows 95 and 98, NT 4.0, 2000, Linux, Unix, Novell, etc.

03.0 Demonstrate proficiency in computer operating systems—-The student will be able to:

- 03.01 Describe types of operating systems.
- 03.02 Understand the history of operating systems.
- 03.03 Explain single-tasking versus multitasking.
- 03.04 Explain single-user versus multi-user operating systems.
- 03.05 Identify current operating systems.
- 03.06 Identify computer hardware.
- 03.07 Identify popular PC processors.
- 03.08 Explain system architectures.
- 03.09 Describe various PC operating systems.
- 03.10 Describe the file system functions.
- 03.11 Explain the DOS/Windows 3.1 file system.
- 03.12 Explain Windows 95/98, NT, and 2000 file systems.
- 03.13 Describe the UNIX file system.
- 03.14 Discuss the Macintosh file system.

03.15 Discuss the installation of an operating system.
03.16 Identify the preparation for installing an operating system.
03.17 Explain how to install MS-DOS, Windows 3.1, Windows 95/98, Windows NT, and Windows 2000.
03.18 Explain how to install UNIX: Linux.
03.19 Explain how to install Mac OS.
03.20 Identify the steps to upgrade an operating system to a newer version.
03.21 Describe the various output, input, and storage devices.
03.22 Explain the various modems and other devices associated with operating systems.
03.23 Describe the network connectivity associated with various operating systems.
03.24 Explain sharing disks and files through server network operating systems.
03.25 Describe accessing and sharing disks and files through client (workstations) network operating systems.
03.26 Identify how to share printing devices through various operating systems.
03.27 Explain network and internet resource servers.
03.28 Describe file system maintenance.
03.29 Explain finding and deleting files on various operating systems.
03.30 Describe how to maintain large and small system disks.
03.31 Identify the process for making backups.
03.32 Explain how to optimize software installations.
03.33 Identify how to tune an operating system.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Computer Specialist**
Career Cluster: **Information Technology**

CCC	
CIP Number	0615.040203
Program Type	College Credit Certificate (CCC)
Program Length	27 credits hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1071
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Computer Engineering Technology AS/AAS degree program (0615.040200).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to computer systems architecture and analysis and design of computer systems. This college credit certificate focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the computer engineering industry; technical and product skills, underlying principles of technology, and safety.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA is the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate proficiency in computer systems architecture.
02.0 Demonstrate proficiency in the use of microcomputer disk operating system services and functions.
03.0 Demonstrate proficiency in computer operating systems.
04.0 Demonstrate proficiency in peripheral equipment.
05.0 Demonstrate proficiency in customer site requirements and considerations.
06.0 Demonstrate proficiency in the analysis and design of peripheral equipment used in computer systems.
07.0 Demonstrate proficiency in computer and network security.
08.0 Demonstrate proficiency in hubs, bridges, routers, and switches.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Computer Specialist**
CIP Number: **0615.040203**
Program Length: **27 credit hours**
SOC Code(s): **15-1071**

This certificate program is part of the Computer Engineering AS/AAS degree program (0650.040200). At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency in computer systems architecture. —The student will be able to:

- 01.01 Draw and explain systems configurations in block detail.
- 01.02 Interpret computer acronyms.
- 01.03 Identify and define priorities and interrupts at system level.
- 01.04 Define and list direct memory access handling systems.
- 01.05 Define functions of advanced memory techniques (e.g. virtual, pipeline, cache).
- 01.06 Troubleshoot a microcomputer system.

02.0 Demonstrate proficiency in the use of microcomputer disk operating system services and functions. --The student will be able to:

- 02.01 Describe the historical development of computer operating systems.
- 02.02 Describe the major hardware and related software subsystem of microcomputer DOS (Disk Operating System).
- 02.03 Describe various disk formats.
- 02.04 Describe the extended services of enhanced systems.
- 02.05 Describe design decisions involved in implementing Input/Output (I/O) interfacing using interrupts.
- 02.06 Program using the extended DOS functions.
- 02.07 Describe the various operating systems, including Windows 95 and 98, NT 4.0, 2000, Linux, Unix, Novell, etc.

03.0 Demonstrate proficiency in computer operating systems. —-The student will be able to:

- 03.01 Describe types of operating systems.
- 03.02 Understand the history of operating systems.
- 03.03 Explain single-tasking versus multitasking.
- 03.04 Explain single-user versus multi-user operating systems.
- 03.05 Identify current operating systems.
- 03.06 Identify computer hardware.
- 03.07 Identify popular PC processors.
- 03.08 Explain system architectures.
- 03.09 Describe various PC operating systems.
- 03.10 Describe the file system functions.
- 03.11 Explain the DOS/Windows 3.1 file system.
- 03.12 Explain Windows 95/98, NT, and 2000 file systems.
- 03.13 Describe the UNIX file system.
- 03.14 Discuss the Macintosh file system.

03.15 Discuss the installation of an operating system.
03.16 Identify the preparation for installing an operating system.
03.17 Explain how to install MS-DOS, Windows 3.1, Windows 95/98, Windows NT, and Windows 2000.
03.18 Explain how to install UNIX: Linux.
03.19 Explain how to install Mac OS.
03.20 Identify the steps to upgrade an operating system to a newer version.
03.21 Describe the various output, input, and storage devices.
03.22 Explain the various modems and other devices associated with operating systems.
03.23 Describe the network connectivity associated with various operating systems.
03.24 Explain sharing disks and files through server network operating systems.
03.25 Describe accessing and sharing disks and files through client (workstations) network operating systems.
03.26 Identify how to share printing devices through various operating systems.
03.27 Explain network and internet resource servers.
03.28 Describe file system maintenance.
03.29 Explain finding and deleting files on various operating systems.
03.30 Describe how to maintain large and small system disks.
03.31 Identify the process for making backups.
03.32 Explain how to optimize software installations.
03.33 Identify how to tune an operating system.

04.0 Demonstrate proficiency in peripheral equipment. -–The student will be able to:

04.01 Install, analyze and troubleshoot interface controllers.
04.02 Install, analyze and troubleshoot display terminals.
04.03 Install, analyze and troubleshoot printer.
04.04 Install, analyze and troubleshoot magnetic tape equipment.
04.05 Install, analyze and troubleshoot disk drive equipment.
04.06 Define environmental requirements for peripherals and media.

05.0 Demonstrate proficiency in customer site requirements and considerations. -–The student will be able to:

05.01 Apply effective customer relations.
05.02 Follow installation procedures.
05.03 Calculate and determine power requirements.
05.04 Calculate and determine environmental requirements.
05.05 List and perform preventative maintenance techniques and requirements.

06.0 Demonstrate proficiency in the analysis and design of peripheral equipment used in computer systems. --The student will be able to:

06.01 Describe and analyze circuits used in various functions of video display systems.
06.02 Analyze various types of disk drives and disk drive controllers.
06.03 Analyze various types of printers and plotters and their related interface controllers.
06.04 Describe the use of RAM (Random-Access Memory) and ROM (Read-Only Memory) for font generation in video display systems.
06.05 Modulation and interval timing techniques.

06.06 Pointing devices for computer systems.
06.07 Analyze the operation of mechanical and optical pointing devices used in computer systems.
06.08 Describe the functions of the major blocks in a dot matrix printer.
06.09 Analyze the communication process using a standard Centronics parallel interface in a printer.
06.10 Describe the main functional blocks of a roller bed plotter.
06.11 Analyze subsystems including interfaces for use in a roller bed plotter.
06.12 Identify the implications of ESD (Electrostatic Discharge).

07.0 Demonstrate proficiency in computer and network security. —The student will be able to:

07.01 Basic understanding of logon, user, file, system, and network security associated with the appropriate operating system.
07.02 Design a basic security system associated with the appropriate operating system.
07.03 Analyze a basic security system associated with the appropriate operating system.
07.04 Troubleshoot a basic security system associated with the appropriate operating system.

08.0 Demonstrate proficiency in hubs, bridges, routers, and switches. -–The student will be able to:

08.01 Identify standalone hubs.
08.02 Discuss the differences between stackable, modular, and intelligent hubs.
08.03 Explain how to install a hub.
08.04 Identify how to choose the right hub.
08.05 Describe the advantage of segmentation.
08.06 Describe segmentation using bridges, switches, and routers.
08.07 Name and describe switching methods.
08.08 Describe network congestion problems in Ethernet networks.
08.09 Describe the benefits of network segmentation with bridges, switches, and routers.
08.10 Distinguish between cut-through and store-and-forward LAN switching.
08.11 Describe the operation of the Spanning Tree Protocol and its benefits.
08.12 Describe the benefits of virtual LANs.
08.13 Identify RIP and IGRP routing protocols.
08.14 Explain the services of separate and integrated multiprotocol routing.
08.15 Identify routing problems.
08.16 Identify router features and functions.
08.17 Describe the features and functions of gateways.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Network Systems Developer**
Career Cluster: **Information Technology**

CCC	
CIP Number	0615.040204
Program Type	College Credit Certificate (CCC)
Program Length	41 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1081
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Computer Engineering Technology AS/AAS degree program (0615.040200).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to computer systems architecture, software, communications, programming, and analysis and design of computer systems.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate proficiency in computer systems architecture.
02.0 Demonstrate proficiency in the use of microcomputer disk operating system services and functions.
03.0 Demonstrate proficiency in structured cabling.
04.0 Demonstrate proficiency in peripheral equipment.
05.0 Demonstrate proficiency in customer site requirements and considerations.
06.0 Demonstrate proficiency in the analysis and design of peripheral equipment used in computer systems.
07.0 Demonstrate proficiency in computer and network security.
08.0 Demonstrate proficiency in hubs, bridges, routers, and switches.
09.0 Demonstrate proficiency in communication interfacing.
10.0 Demonstrate proficiency in customer relations.
11.0 Demonstrate proficiency in computer networking techniques.
12.0 Demonstrate proficiency in analysis and design of data communications system.
13.0 Demonstrate appropriate math skills.
14.0 Demonstrate proficiency in structured cabling.
15.0 Demonstrate proficiency in network troubleshooting.
16.0 Demonstrate proficiency in network design.
17.0 Demonstrate proficiency in wireless devices.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Network Systems Developer**
CIP Number: **0615.040204**
Program Length: **41 Credit Hours**
SOC Code(s): **15-1081**

This certificate program is part of the Computer Engineering Technology AS/AAS degree program (0615.040200). At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency in computer systems architecture—The student will be able to:

- 01.01 Draw and explain systems configurations in block detail.
- 01.02 Interpret computer acronyms.
- 01.03 Identify and define priorities and interrupts at system level.
- 01.04 Define and list direct memory access handling systems.
- 01.05 Define functions of advanced memory techniques (e.g. virtual, pipeline, cache).
- 01.06 Troubleshoot a microcomputer system.

02.0 Demonstrate proficiency in the use of microcomputer disk operating system services and functions--The student will be able to:

- 02.01 Describe the historical development of computer operating systems.
- 02.02 Describe the major hardware and related software subsystem of microcomputer DOS (Disk Operating System).
- 02.03 Describe various disk formats.
- 02.04 Describe the extended services of enhanced systems.
- 02.05 Describe design decisions involved in implementing
- 02.06 Input/Output (I/O) interfacing using interrupts.
- 02.07 Program using the extended DOS functions.
- 02.08 Describe the various operating systems, including Windows 95 and 98, NT 4.0, 2000, Linux, Unix, Novell, etc.

03.0 Demonstrate proficiency in computer operating systems—-The student will be able to:

- 03.01 Describe types of operating systems.
- 03.02 Understand the history of operating systems.
- 03.03 Explain single-tasking versus multitasking.
- 03.04 Explain single-user versus multi-user operating systems.
- 03.05 Identify current operating systems.
- 03.06 Identify computer hardware.
- 03.07 Identify popular PC processors.
- 03.08 Explain system architectures.
- 03.09 Describe various PC operating systems.
- 03.10 Describe the file system functions.
- 03.11 Explain the DOS/Windows 3.1 file system.
- 03.12 Explain Windows 95/98, NT, and 2000 file systems.
- 03.13 Describe the UNIX file system.
- 03.14 Discuss the Macintosh file system.

03.15 Discuss the installation of an operating system.
03.16 Identify the preparation for installing an operating system.
03.17 Explain how to install MS-DOS, Windows 3.1, Windows 95/98, Windows NT, and Windows 2000.
03.18 Explain how to install UNIX: Linux.
03.19 Explain how to install Mac OS.
03.20 Identify the steps to upgrade an operating system to a newer version.
03.21 Describe the various output, input, and storage devices.
03.22 Explain the various modems and other devices associated with operating systems.
03.23 Describe the network connectivity associated with various operating systems.
03.24 Explain sharing disks and files through server network operating systems.
03.25 Describe accessing and sharing disks and files through client (workstations) network operating systems.
03.26 Identify how to share printing devices through various operating systems.
03.27 Explain network and internet resource servers.
03.28 Describe file system maintenance.
03.29 Explain finding and deleting files on various operating systems.
03.30 Describe how to maintain large and small system disks.
03.31 Identify the process for making backups.
03.32 Explain how to optimize software installations.
03.33 Identify how to tune an operating system.

04.0 Demonstrate proficiency in peripheral equipment-–The student will be able to:

04.01 Install, analyze and troubleshoot interface controllers.
04.02 Install, analyze and troubleshoot display terminals.
04.03 Install, analyze and troubleshoot printer.
04.04 Install, analyze and troubleshoot magnetic tape equipment.
04.05 Install, analyze and troubleshoot disk drive equipment.
04.06 Define environmental requirements for peripherals and media.

05.0 Demonstrate proficiency in customer site requirements and considerations--The student will be able to:

05.01 Apply effective customer relations.
05.02 Follow installation procedures.
05.03 Calculate and determine power requirements.
05.04 Calculate and determine environmental requirements.
05.05 List and perform preventative maintenance techniques and requirements.

06.0 Demonstrate proficiency in the analysis and design of peripheral equipment used in computer systems--The student will be able to:

06.01 Describe and analyze circuits used in various functions of video display systems.
06.02 Analyze various types of disk drives and disk drive controllers.
06.03 Analyze various types of printers and plotters and their related interface controllers.
06.04 Describe the use of RAM (Random-Access Memory) and ROM (Read-Only Memory) for font generation in video display systems.
06.05 Modulation and interval timing techniques.

06.06 Pointing devices for computer systems.
06.07 Analyze the operation of mechanical and optical pointing devices used in computer systems.
06.08 Describe the functions of the major blocks in a dot matrix printer.
06.09 Analyze the communication process using a standard Centronics parallel interface in a printer.
06.10 Describe the main functional blocks of a roller bed plotter.
06.11 Analyze subsystems including interfaces for use in a roller bed plotter.
06.12 Identify the implications of ESD (Electrostatic Discharge).

07.0 Demonstrate proficiency in computer and network security—The student will be able to:

07.01 Basic understanding of logon, user, file, system, and network security associated with the appropriate operating system.
07.02 Design a basic security system associated with the appropriate operating system.
07.03 Analyze a basic security system associated with the appropriate operating system.
07.04 Troubleshoot a basic security system associated with the appropriate operating system.

08.0 Demonstrate proficiency in hubs, bridges, routers, and switches-–The student will be able to:

08.01 Identify standalone hubs.
08.02 Discuss the differences between stackable, modular, and intelligent hubs.
08.03 Explain how to install a hub.
08.04 Identify how to choose the right hub.
08.05 Describe the advantage of segmentation.
08.06 Describe segmentation using bridges, switches, and routers.
08.07 Name and describe switching methods.
08.08 Describe network congestion problems in Ethernet networks.
08.09 Describe the benefits of network segmentation with bridges, switches, and routers.
08.10 Distinguish between cut-through and store-and-forward LAN switching.
08.11 Describe the operation of the Spanning Tree Protocol and its benefits.
08.12 Describe the benefits of virtual LANs.
08.13 Identify RIP and IGRP routing protocols.
08.14 Explain the services of separate and integrated multiprotocol routing.
08.15 Identify routing problems.
08.16 Identify router features and functions.
08.17 Describe the features and functions of gateways.

09.0 Demonstrate proficiency in communication interfacing--The student will be able to:

09.01 Identify and define serial, parallel, USB, and FireWire interface standards.
09.02 Identify, define and configure sync and async devices.
09.03 Demonstrate the use of interface devices.
09.04 Identify and define networking levels.
09.05 Identify and define protocols.
09.06 Identify and define multi-user systems.

09.07 Troubleshoot and repair network systems.
09.08 Demonstrate the use of a protocol analyzer.

10.0 Demonstrate proficiency in customer relations--The student will be able to:

10.01 Describe effective listening techniques.
10.02 Describe techniques for instilling customer confidence.
10.03 Describe techniques for keeping the customer informed.
10.04 Demonstrate proper follow-up techniques.

11.0 Demonstrate proficiency in customer networking techniques—The student will be able to:

11.01 Identify and define computer networking techniques.
11.02 Design a system using hardware and software communication protocols.
11.03 Apply management techniques for network software.

12.0 Demonstrate proficiency in analysis and design of data communication systems--The student will be able to:

12.01 Describe the different types of digital data communications systems.
12.02 Describe data formats and transmission rates in serial data communications systems.
12.03 Identify and define available options for integration of a display terminal in a data communication system.
12.04 Identify and define communication signals and protocol for MODEM (Modulator Demodulator) links.
12.05 Apply error detection and correction in digital communication systems.
12.06 Define communication protocols.
12.07 Design and apply multiplexing techniques for computer.

13.0 Demonstrate appropriate math skills--The student will be able to:

13.01 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
13.02 Perform Algebraic formulations.

14.0 Demonstrate proficiency in structured cabling--The student will be able to:

14.01 Identify and define data cabling.
14.02 Describe the cabling standards.
14.03 Identify and describe the correct cabling.
14.04 Describe the various constraints of cable systems and infrastructures.
14.05 Describe the various components of a cabling system.
14.06 Identify and demonstrate the tools utilized in cabling.
14.07 Describe the different network media and connectors utilized in structure cabling.
14.08 Analyze and design a structure wiring cabling system.
14.09 Demonstrate a successful structured wiring installation.
14.10 Describe and demonstrate testing, as well as troubleshooting techniques in structured cabling.
14.11 Develop a structure wiring proposal.

15.0 Demonstrate proficiency in network troubleshooting--The student will be able to:

15.01 Explain LAN standards and the OSI model.
15.02 Describe the proper method of documenting a network.
15.03 Identify cable, power line, analog interface, and digital interface testing tools.
15.04 Identify protocol analyzers.
15.05 Identify the troubleshooting techniques for various cabling systems.
15.06 Identify how to troubleshoot Token Ring networks.
15.07 Identify how to troubleshoot Ethernet networks.
15.08 Identify how to troubleshoot FDDI networks.

16.0 Demonstrate proficiency in network design—The student will be able to:

16.01 Explain the OSI model for LAN and WAN communications.
16.02 Apply the OSI model to realistic networking situations.
16.03 Describe the basic LAN topologies and transport methods.
16.04 Explain basic WAN topologies and transport methods.
16.05 Describe the various functions of the principle networking standards organizations.
16.06 Describe various kinds of network media.
16.07 Compare packet and cell implementations and interfaces.
16.08 Explain WAN carrier types for point-to-point, T-carriers, SONET, ISDN, and wireless technologies.
16.09 Describe the purpose of LAN network transmission equipment, including NICs, repeaters, MAUs, hubs, routers, brouters, switches, and gateways.
16.10 Explain how LAN network equipment works.
16.11 Describe the purpose of WAN network equipment, including multiplexers, channel banks, private networks, modems, access servers, and routers.
16.12 Explain how WAN network equipment works.
16.13 Design LAN topologies using media and equipment for different kinds of applications.
16.14 Design a LAN to connect to a WAN.
16.15 Discuss WAN topology options according to pricing, bandwidth needs, and equipment needs.
16.16 Explain how video and audio are transported over networks.
16.17 Discuss voice, video, and data integration issues.
16.18 Explain how multimedia data transmission works.
16.19 Design LANs and WANs for integrated voice, video, and data transmissions.
16.20 Describe TCP/IP.
16.21 Explain how TCP and IP are implemented on networks.
16.22 Explain how UDP is employed with IP.
16.23 Describe IP addressing and understand how to use it on LANs and WANs.
16.24 Describe the new IP version 6 and understand how to design it into your expanding network.
16.25 Discuss and use application protocols in the TCP/IP suite.
16.26 Explain WAN Transport Methods – X.25, Frame Relay, ISDN, SMDS, DSL, SONET.
16.27 Explain ATM Technologies – Characteristics, Layered Communications, Cell structure.
16.28 Explain ATM design considerations.
16.29 Describe ATM topologies.

16.30 Explain ATM backbone networks.
16.31 Describe ATM LAN applications.
16.32 Network Protocol Architectures: Advantages and Disadvantages.

17.0 Demonstrate proficiency in wireless devices –The student will be able to:

17.01 Describe at least three wireless media such as: radio wave, microwave, and infrared.
17.02 Describe cellular wireless point-to-point and multipoint topology strategies.
17.03 Identify the types of wireless networks and the uses of each.
17.04 Describe the types of signal transmission used in mobile computing such as: packet-radio communication, cellular networks, and satellite stations.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Wireless and IP Communications Technician**
Career Cluster: **Information Technology**

CCC	
CIP Number	0615.040205
Program Type	College Credit Certificate (CCC)
Program Length	15 credit hours
CTSO	Phi Beta Lambda, BPA (Business Professionals of America)
SOC Codes (all applicable)	15-1081
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm

Purpose

This certificate program is part of the Computer Engineering Technology AS/AAS degree program (0615.040200).

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.).

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

This program prepares individuals to design, install, configure, and troubleshoot wireless and IP Telephony networks. Graduates of this technical program will be prepared to enter advanced training and education in specialized IP Communications related fields.

The content includes but is not limited to RF Fundamentals, use of circuit diagrams and schematics, soldering, Wireless Site Surveying, Wireless Security, Design of Converged and Integrated Services Networks, Fundamentals of Voice over IP, Voice Gateway Protocols, and Introduction to Routing and Switching.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these

occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and BPA are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Standards

After successfully completing this course the student will be able to perform the following:

01.0 Demonstrate proficiency in computer systems architecture.
02.0 Demonstrate proficiency in communication interfacing.
03.0 Demonstrate proficiency in customer relations.
04.0 Demonstrate proficiency in computer networking techniques.
05.0 Demonstrate proficiency in analysis and design of data communications systems.
06.0 Demonstrate appropriate communication skills.
07.0 Demonstrate employability skills.
08.0 Demonstrate proficiency in RF Math Calculations.
09.0 Demonstrate proficiency in planning and deploying Wireless LANs.
10.0 Demonstrate proficiency in Conducting Site Surveying
11.0 Demonstrate proficiency in implementing Wireless LAN security.
12.0 Demonstrate proficiency in configuring IP Telephony servers.
13.0 Demonstrate proficiency in interconnecting network devices.
14.0 Demonstrate proficiency in configuring and troubleshooting Voice Gateways.
15.0 Demonstrate proficiency in configuring Quality of Service for Integrated Services Networks

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Wireless and IP Communications Technician**
CIP Number: **0615.040205**
Program Length: **15 credit hours**
SOC Code(s): **15-1081**

This certificate program is part of the Computer Engineering Technology AS/AAS degree program (0615.040200). At the completion of this program, the student will be able to:

01.0 Demonstrate proficiency in computer systems architecture--The student will be able to:

- 01.01 Draw and explain systems configurations in block detail.
- 01.02 Interpret computer acronyms.
- 01.03 Identify and define priorities and interrupts at system level.
- 01.04 Define and list direct memory access handling systems.
- 01.05 Define functions of advanced memory techniques (e.g. virtual, pipeline, cache).
- 01.06 Troubleshoot a microcomputer system.

02.0 Demonstrate proficiency in communication interfacing--The student will be able to:

- 02.01 Identify and define serial and parallel interface standards.
- 02.02 Identify, define and configure sync and async devices.
- 02.03 Demonstrate the use of interface devices.
- 02.04 Identify and define networking levels.
- 02.05 Identify and define protocols.
- 02.06 Troubleshoot and repair network systems.
- 02.07 Identify and define multi-user systems.

03.0 Demonstrate proficiency in customer relations--The student will be able to:

- 03.01 Describe effective listening techniques.
- 03.02 Describe techniques for instilling customer confidence.
- 03.03 Describe techniques for keeping the customer informed.
- 03.04 Demonstrate proper follow-up techniques.

04.0 Demonstrate proficiency in computer networking techniques--The student will be able to:

- 04.01 Identify and define computer networking techniques.
- 04.02 Design a system using hardware and software communication protocols.
- 04.03 Apply management techniques for network software.

05.0 Demonstrate proficiency in analysis and design of data communications systems--The student will be able to:

- 05.01 Describe the different types of digital data communications systems.
- 05.02 Describe data formats and transmission rates in serial data communications systems.

05.03 Design the connections and programming for a UART (Universal Asynchronous/Synchronous Receiver Transmitter) in a microprocessor-based system.
05.04 Identify and define available options for integration of a display terminal in a data communication system.
05.05 Identify and define communication signals and protocol for MODEM (Modulator Demodulator) links.
05.06 Apply digital modulation techniques including PAM (Pulse-Amplitude Modulation), PCM (Pulse-Code Modulation), PWM (Pulse-Width Modulation) and delta modulation.
05.07 Analyze and design circuits for generation and detection of digital modulation.
05.08 Apply error detection and correction in digital communication systems.
05.09 Define communication protocols.
05.10 Design and apply multiplexing techniques for computer.

06.0 Demonstrate appropriate communication skills—The student will be able to:

06.01 Write logical and understandable statements, or phrases, to accurately fill out forms/invoices commonly used in business and industry.
06.02 Read and understand graphs, charts, diagrams, and tables commonly used in this industry/occupation area.
06.03 Read and follow written and oral instructions.
06.04 Answer and ask questions coherently and concisely.
06.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
06.06 Demonstrate appropriate telephone/communication skills.

07.0 Demonstrate proficiency in RF math calculations-- The student will be able to:

07.01 Convert between milliwatts and dBm.
07.02 Use power calculations to calculate change in power.
07.03 Explain the concepts of polarization, gain, beam width and free-space path loss.
07.04 Identify the basic attributes, purposes, and functions of antenna types.
07.05 Identify and apply the concepts that make up the functionality of spread spectrum technology.
07.06 Recognize concepts associated with wireless LAN service sets.
07.07 Calculate the Fresnel Zone radius.
07.08 Investigate the relationship between range and signal strength.

08.0 Demonstrate proficiency in planning and deploying wireless LANs--The student will be able to:

08.01 Set up a wireless client.
08.02 Understand the concept of an SSID.
08.03 Understand the nature of an ad hoc wireless network.
08.04 Use Windows XP to manage a wireless connection.
08.05 Explain the purpose of the HyperTerminal program.
08.06 Identify the equipment necessary to connect locally to an access point for configuration via HyperTerminal.
08.07 Describe the basic commands used to display the access point's configuration and interface information, and to configure an IP address.

08.08 Identify the purpose of infrastructure devices and how to install, configure, and manage them.
08.09 Identify the purpose of LAN client devices and how to install, configure and manage them.
08.10 Identify, understand, correct, or compensate for wireless LAN implementation challenges.
08.11 Explain the trade-off between range and throughput.
08.12 Analyze direct sequence spread spectrum behavior in a co-located channel environment.
08.13 Examine co-channel interference using different access points.

09.0 Demonstrate proficiency in conducting site surveying -- The student will be able to:

09.01 Identify and understand the importance and process of conducting a thorough site survey.
09.02 Identify and understand the importance of the necessary tasks to do an RF site survey.
09.03 Identify the necessary equipment needed to perform a site survey.
09.04 Assess the performance of an ad hoc wireless network by calculating throughput.
09.05 Assess the performance of an infrastructure wireless network by calculating throughput.
09.06 Identify and discuss the design elements for creating an extended service set.
09.07 Differentiate between layer-two and layer-three roaming.
09.08 Discuss the configuration of mobile IP as it pertains to wireless communication.
09.09 Conduct a feasibility-study/return-on-investment study for deploying wireless solutions in a production environment.
09.10 Baseline the performance of the wireless network and plan for future growth.

10.0 Demonstrate proficiency in implementing wireless LAN security - The student will be able to:

10.01 Identify the strengths, weaknesses, and appropriate uses of wireless LAN security techniques.
10.02 Describe the types of wireless attacks, and explain how to identify and prevent them.
10.03 Create and apply a MAC filter.
10.04 Configure open authentication with Wired-Equivalent Privacy.
10.05 Configure Service Set Identification in more secured manner.
10.06 Analyze the impact of spoofed MAC addresses on the security of a wireless network.
10.07 Create and apply IP filters.
10.08 Configure the Temporal Key Integrity Protocol.
10.09 Describe the problem of rouge access points and identify techniques of locating rouge access points.
10.10 Demonstrate proficiency in using wireless protocols analyzer.
10.11 Implement and configure WiFi Protected Access (WPA) and WPA version 2.
10.12 Configure Secure Shell sessions as a way to remotely manage access points and wireless bridges.
10.13 Implement and configure 802.1x authentication standards.
10.14 Implement and configure wireless encryption.

11.0 Demonstrate proficiency in configuring IP telephony servers -- The student will be able to:

11.01 Differentiate between packet-switched voice networks and circuit-switched voice networks.
11.02 Explain the role of Ethernet telephony servers in call admission.
11.03 Install and configure telephony servers such as Cisco call manager, and Linux Trixbox.
11.04 Configure IP phones to successfully register with telephony servers.
11.05 Explain the call routing login used by telephony servers.
11.06 Configure individualized routing using Partitions and call search spaces.
11.07 Configure the basic functions of IP phones such as: call park, call forwarding, and call pickup.
11.08 Configure telephony servers with basic functions such as: call conferencing, meet-me extensions, and digital receptionist.
11.09 Explain and differentiate among the following compression algorithms: G.711, G.729, G.226, and iLBC.
11.10 Configure Device pools, Regions and Locations.
11.11 Troubleshoot IP Telephony servers by analyzing log files.
11.12 Troubleshoot the performance of an IP telephony network by analyzing the output of a protocol analyzer.
11.13 Install, configure, and register soft phones such as Cisco IP Communicator, and X-lite to register with IP telephony servers.

12.0 Demonstrate proficiency in interconnecting network devices--The student will be able to:

12.01 Identify the equipment needed in building packet-switched voice networks.
12.02 Explain the role of each of the devices needed to build a packet-switched voice network.
12.03 Configure Ethernet switches with voice VLANs.
12.04 Configure switches with power-over Ethernet.
12.05 Configure wireless access points with voice VLANs.
12.06 Identify the different types of cables needed to interconnect networking devices.
12.07 Explain the difference between collision domains and broadcast domains.
12.08 Configure VLAN trunking.
12.09 Analyze a switch’s MAC address table.
12.10 Analyze a router’s routing table
12.11 Analyze an access point’s association table.
12.12 Troubleshoot the connection between networking devices using network management applications such as Kiwi Syslog.

13.0 Demonstrate proficiency in configuring and troubleshooting voice gateways--The student will be able to:

13.01 Explain the role of voice gateways in packet-switched voice networks.
13.02 Explain the process of registering voice gateways with an IP telephony server.
13.03 Install and configure an H.323 voice gateway.
13.04 Install and configure a SIP voice gateway.
13.05 Install and configure an MGCP voice gateway.
13.06 Recognize different voice network modules and voice interfaces in voice gateways.

13.07 Configure a voice gateway with VoIP and POTS dial peers.
13.08 Configure a voice gateway with routing protocols such as RIP and EIGRP.
13.09 Troubleshoot the performance of a voice gateway by utilizing debug and show commands.
13.10 Explain the role of voice gateways in connecting packet-switched voice networks to circuit-switched voice networks.

14.0 Demonstrate proficiency in configuring quality of service for integrated services networks--The student will be able to:

14.01 Explain latency, packet loss, and jitter.
14.02 Identify sources of delay.
14.03 Identify techniques for implementing quality of service over low speed links.
14.04 Configure Differentiated services to support a VoIP call.
14.05 Configure Ethernet switches with class of service
14.06 Explain the classification, tagging and queuing of IP packets.
14.07 Implement and configure Cisco Auto quality of service.
14.08 Identify and troubleshoot quality-of-service related problems in a packet-switched voice network.

15.0 Demonstrate employability skills--The student will be able to:

15.01 Conduct a job search.
15.02 Secure information about a job.
15.03 Identify documents that may be required when applying for a job.
15.04 Complete a job application form correctly.
15.05 Demonstrate competence in job interview techniques.
15.06 Demonstrate knowledge of how to make appropriate decisions.
15.07 Demonstrate appropriate work/behavioral habits.
15.08 Demonstrate acceptable employee personal hygiene and health.
15.09 Demonstrate knowledge of the "Florida Right-To-Know Law" as recorded in Florida Statutes Chapter 442.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Database and Programming Essentials**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	8206400	Y300100
CIP Number	0507.039906	0507.039906
Grade Level	9-12, 30, 31	30, 31
Standard Length	4 credits	600 hours
Teacher Certification	BUS ED 1 @2 COMPU SCI 6	BUS ED 1 @2 COMPU SCI 6
Additional teacher certifications accepted:	Any Academic Field PLUS appropriate industry certification.	Any Academic Field PLUS appropriate industry certification.
CTSO	FBLA BPA	Phi Beta Lambda BPA
SOC Codes	15-1061	15-1061
Facility Code	212 http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	Mathematics: 11.0 Language: 11.0 Reading: 11.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and entry-level database and internet/web related careers; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, and technical skills related to database and Internet technologies skills using the latest industry tools. This curriculum is project-based and modeled after the Oracle Academy.

Program Structure

This program is a planned sequence of instruction consisting of the Business Technology Education Core and one occupational completion point. Students who have previously completed the Business Technology Education Core will not have to repeat the core. It is recommended that students complete Algebra I and a programming/flow-charting course concurrently or prior to taking this program.

When offered at the post secondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	OTA0040	Information Technology Assistant	150	15-1061
	CTS0046	Database Fundamentals	150	
	CTS0047	Specialized Database Programming	150	
	CTS0067	Specialized Database Applications	150	

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8200320	Keyboarding and Business Skills	.5 credit	15-1061	2
		AND			
	8200330	Computer and Business Skills	.5 credit		2
		OR			
	8209020	Computing for College and Careers	1 credit		2
		OR			
	8207310	Introduction to Information Technology	1 credit		2
	8206410	Database Fundamentals	.5 credit	15-1061	2
	8206420	Data Control and Functions	.5 credit	15-1061	2
	8206430	Specialized Database Programming	1 credit	15-1061	3
	8206440	Specialized Database Applications	1 credit	15-1061	3

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills for secondary students. For postsecondary students, Phi Beta Lambda and BPA are the appropriate student organizations. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 11.0, Language 11.0, and Reading 11.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be

able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

The PSAV component of this program has no statewide articulation agreement approved by the Articulation Coordinating Committee. However, this does not preclude the awarding of credits by any college through local agreements.

For details on statewide articulation agreements which correlate to programs and industry certifications, refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

After successfully completing this program, the student will be able to perform the following:

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning though job shadowing, mentoring, e-coaching, etc.
08.0 Demonstrate personal and interpersonal skills appropriate for the workplace.
09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use Technology to apply and enhance communications skills in technical reading, writing.
04.0 Practice quality performance in the learning environment and the workplace.
05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.

08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
09.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
11.0 Perform e-mail activities.
12.0 Demonstrate operating systems.
13.0 Develop an awareness of emerging technologies.

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance and enhance personal performance in relation to the workplace. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance the effectiveness of communication skills.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal and professional ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
10.0 Demonstrate personal and interpersonal skills and attributes appropriate for the workplace.
11.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
12.0 Perform e-mail activities.
13.0 Demonstrate operating systems.
14.0 Develop an awareness of emerging technologies.

OR

Introduction to IT Competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.
02.0 Demonstrate Comprehension and communication skills.

03.0 Use technology to enhance the effectiveness of communication skills.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.
10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
11.0 Participate in work-based learning experiences.
12.0 Perform e-mail activities.
13.0 Demonstrate knowledge of different operating systems.
14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW.
15.0 Demonstrate proficiency using HTML commands.
16.0 Demonstrate proficiency in page design applicable to the WWW.
17.0 Demonstrate proficiency using specialized web design software.
18.0 Develop an awareness of the information technology industry.
19.0 Develop an awareness of microprocessors and digital computers.
20.0 Develop an awareness of programming languages.
21.0 Develop an awareness of emerging technologies.
22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model.
23.0 Demonstrate proficiency using common software applications.
24.0 Demonstrate proficiency using specialized software applications.

25.0 Develop an awareness of the changes taking place in the Information Age and how they fit into an evolving society.
26.0 Develop the "big picture" of database design and how to best organize data according to business rules and/or client needs.
27.0 Develop the process of creating an entity by identifying relationships.
28.0 Formulate and assemble initial Entity Relationship by expanding on modeling concepts.
29.0 Consider the degree and optionality of relationships of entities.
30.0 Demonstrate proficiency in early construction stages of the data modeling process by using unique identifiers and Many-to-Many (M:M) relationships for building Entity Relationship Diagrams.
31.0 Demonstrate proficiency in advanced data constructs by analyzing business requirements and diagramming entities and relationships.
32.0 Demonstrate proficiency in data storage and dangers in designing the process for storage by adding complexity to an Entity-Relationship Model (ERM).
33.0 Apply the complex ERM information by fine tuning entities and the process for relating them.
34.0 Apply initial database design and normalization by following the set of house rules that determine how items are stored and retrieved.
35.0 Demonstrate proficiency in the technique of normalization by labeling and organizing all

items in a database in such a way as to prevent any confusion of mistakes.

36.0 Demonstrate proficiency in table normalization by combining the techniques of an Entity Relationship Model or a top-down, business approach to data with Normalization or a bottom-up mathematical approach to data.

37.0 Apply blueprint principles to begin designing a tool for creating a web-based interface access to a database.

38.0 Extend the ERM presentation model by normalizing the data and mapping the management system.

39.0 Apply techniques for building a storage management system by creating a website using templates and wizards.

40.0 Demonstrate storage closet design and functionality by constructing a group business presentation.

41.0 Demonstrate comprehension of database modeling competency through group presentation.

42.0 Demonstrate comprehension that the database management software is a system for organizing the storage unit (or database) according to business needs and rules, through data integrity constraints.

43.0 Demonstrate comprehension of aspects of SQL Language interface by writing basic SQL statements.

44.0 Demonstrate proficiency working with columns, characters, and rows in SQL.

45.0 Demonstrate proficiency in using SQL comparison operators.

46.0 Demonstrate proficiency in using logical comparisons and precedence rules.

47.0 Demonstrate proficiency using SQL single row functions.

48.0 Demonstrate proficiency displaying data from multiple tables.

49.0 Demonstrate proficiency aggregating data using group functions.

50.0 Demonstrate proficiency utilizing subqueries.

51.0 Demonstrate proficiency producing readable output with SQL language interface and reporting tool and manipulating data.

52.0 Demonstrate proficiency creating and managing database objects.

53.0 Demonstrate proficiency altering tables and constraints implementing views.

54.0 Demonstrate mastery of creating and implementing views, synonyms, indexes and other database objects.

55.0 Demonstrate ability to control user access and SQL language interface and reporting tool.

56.0 Demonstrate comprehension of bundling features of SQL.

57.0 Demonstrate comprehension working with composite data types by writing executable script files.

58.0 Describe the differences between SQL and PL/SQL

59.0 Create PL/SQL blocks.

60.0 Use variables in PL/SQL.

61.0 Recognize lexical units.

62.0 Recognize data types.

63.0 Use scalar data types.

64.0 Use various types of joins.

65.0 Use SQL group functions and subqueries.

66.0 Write PL/SQL executable statements.

67.0 Use nested blocks and variable scope.

68.0 Use good programming practices.

69.0 Write DML statements to manipulate data.

70.0 Retrieve data using PL/SQL.
71.0 Manipulate data using PL/SQL.
72.0 Use transaction control statements.
73.0 Use IF conditional control statements.
74.0 Use CASE conditional control statements.
75.0 Use basic loop iterative control statements.
76.0 Use WHILE and FOR loop iterative control statements.
77.0 Use nested loop iterative control statements.
78.0 Use explicit cursors.
79.0 Use explicit cursor attributes.
80.0 Use cursor for loops.
81.0 Use cursors with parameters.
82.0 Use cursors for update transactions.
83.0 Use multiple cursors.
84.0 Handle exceptions.
85.0 Trap Oracle server exceptions.
86.0 Trap user-defined exceptions.
87.0 Create procedures.
88.0 Use parameters in procedures.
89.0 Pass parameters.
90.0 Create stored functions.
91.0 Use functions in SQL statements.
92.0 Manage procedures and functions.
93.0 Manage object privileges.
94.0 Use invoker's rights.
95.0 Create packages.
96.0 Manage package constructs.
97.0 Use advanced package concepts.
98.0 Manage persistent state of package variables.
99.0 Use Oracle-supplied packages.
100.0 Understand dynamic SQL.
101.0 Understand triggers.
102.0 Create DML triggers.
103.0 Create DDL and database event triggers.
104.0 Manage triggers.
105.0 Use large object data types.
106.0 Manage BFILES.
107.0 Manage indexes.
108.0 Manage dependencies.

109.0 Program a database application.
110.0 Utilize the basic concepts of database design.
111.0 Utilize SQL and union queries.
112.0 Implement program statements using objects.
113.0 Utilize debugging tools and write error handlers.
114.0 Demonstrate file I/O.
115.0 Create forms and identify all the properties of a form.
116.0 Manipulate data using object models
117.0 Develop custom controls.
118.0 Utilize API functions.
119.0 Demonstrate database replication and implement database replication using

programming tools.
120.0 Analyze and implement security options.
121.0 Implement client/server applications.
122.0 Optimize the performance of a database.
123.0 Perform application distribution.
124.0 Test and debug databases.

125.0 Demonstrate language arts knowledge and skills.
126.0 Demonstrate mathematics knowledge and skills.
127.0 Demonstrate science knowledge and skills.
128.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
129.0 Solve problems using critical thinking skills, creativity and innovation.
130.0 Use information technology tools.
131.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
132.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
133.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
134.0 Describe the importance of professional ethics and legal responsibilities.
135.0 Explain the importance of employability skill and entrepreneurship skills.
136.0 Demonstrate personal money-management concepts, procedures, and strategies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Database and Programming Essentials**
PSAV Number: **Y300100**

Course Number: OTA0040
Occupational Completion Point: A
Information Technology Assistant – 150 Hours – SOC Code 15-1061

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Demonstrate basic file management skills.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 03.01 Select and use word processing software and accompanying features to enhance written business communications.
- 03.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.
- 03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

07.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
07.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
07.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
07.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

08.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

08.01 Accept constructive criticism.
08.02 Apply appropriate strategies to manage and resolve conflict in work situations.
08.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

09.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
09.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic file management skills.
01.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

02.01 Take notes, organize, summarize, and paraphrase ideas and details.
02.02 Accurately follow written and oral instructions.
02.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
03.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

04.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
04.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

05.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
05.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
05.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
06.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
06.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

07.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
07.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

07.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

08.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
08.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
08.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
08.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
08.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
08.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
08.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
08.08 Build mentor relationships with local professionals in the industry.

09.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

09.01 Accept constructive criticism.
09.02 Apply appropriate strategies to manage and resolve conflict in work situations.
09.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

10.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

11.0 Perform e-mail activities. – The student will be able to:

11.01 Describe e-mail capabilities and functions.
11.02 Use the Internet to perform e-mail activities.

12.0 Demonstrate operating systems. – The student will be able to:

12.01 Identify operating system file naming conventions.

12.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
12.03 Demonstrate a working knowledge of standard file formats.
12.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

13.0 Develop an awareness of emerging technologies. – The student will be able to:

13.01 Compare and contrast various methods of evaluation for emerging technologies.
13.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
13.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. – The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic computer file management skills.
01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
02.02 Write clear and well-organized research papers, integrating a variety of information.
02.03 Prepare and deliver an oral report with appropriate materials to the class
02.04 Participate in large group discussions as a member and/or a leader.
02.05 Take notes, organize, summarize, and paraphrase ideas and details.
02.06 Accurately follow written and oral instructions.
02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills. – The student will be able to:

- 03.01 Select and use word processing software and accompanying features to enhance written business communications. (LA.B.1.4.1)
- 03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience. (LA.B.1.4.1, LA.B.1.4.2, LA.B.1.4.3)
- 03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication. (LA.B.2.4.1, LA.B.2.4.2)
- 03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
- 03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles. – The student will be able to:

- 04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
- 04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
- 04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

- 05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
- 05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

- 06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
- 06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
- 06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance. – The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures. (MA.E.1.4.1, MA.E.A.4.2)
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time). (MA.B.3.4.1)
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate. (MA.A.3.4.3)

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up). (LA.C.3.4.4)
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace. – The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities–The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems–The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies. – The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Introduction to Information Technology competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. – The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

- 03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
- 03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles. – The student will be able to:

- 04.01 Explore, design, implement, and evaluate organizational structures and cultures.
- 04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
- 04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

- 05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
- 05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance. – The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace. – The student will be able to:

10.01 Accept constructive criticism.
10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences. – The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.
12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.
12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the www – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.

14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using html commands – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the www – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software - The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry - The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.

18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers - The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages - The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies - The student will be able to:
21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the open systems interface (osi) model - The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications - The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail,

presentation, database, scheduling, financial management, Java applet, music, etc.).

23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications - The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

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25.0 Develop an awareness of the changes taking place in the information age and how they fit into an evolving society. – The student will be able to:

25.01 Cite examples of jobs, salary, and opportunities he/she will have as a result of participating in the Academy.
25.02 Describe the role a database plays in a business and predict its evolution.
25.03 Demonstrate the difference between "data" and "information."
25.04 Understand the importance of clear communication when discussing business informational requirements.
25.05 Identify important historical contributions in database development and design.

26.0 Develop the "big picture" of database design and how to best organize data according to business rules and/or client needs. – The student will be able to:

26.01 Identify and analyze the phases of the database development process.
26.02 Explain what conceptual data modeling and database design involve.
26.03 Compare database development Process with that of the application development process.
26.04 Distinguish between a conceptual model and a physical implementation.

27.0 Develop the process of creating an entity by identifying relationships. – The student will be able to:

27.01 Identify and model various types of entities.
27.02 Identify naming and drawing conventions for entities.
27.03 Sequence the steps that are necessary for creation of an entity.
27.04 Analyze and model the relationships between entities.

28.0 Formulate and assemble initial entity relationship by expanding on modeling concepts. – The student will be able to:

28.01 Analyze and model attributes.
28.02 Identify unique identifiers for each entity.
28.03 Develop an entity relationship diagram tagging attributes with optionality.

29.0 Consider the degree and optionality of relationships of entities. – The student will be able to:

29.01 Create entity relationship models based on information requirements and interviews.
29.02 Differentiate between one-to-many, many-to-many and one-to-one relationships.
29.03 Identify relationship between two entities by reading a given diagram.
29.04 Create a relationship between instances of the same entity.
29.05 Read an entity relationship model in order to validate it.

30.0 Demonstrate proficiency in early construction stages of the data modeling process by using unique identifiers and many-to-many (M:M) relationships for building entity relationship diagrams. – The student will be able to:

30.01 Identify the significance of an attribute that has more than one value for each entity instance.
30.02 Evaluate appropriate methods of storing validation rules for attributes.
30.03 Recognize unique identifiers inherited from other entities.
30.04 Sequence the steps involved in resolving a many-to-many relationship.

31.0 Demonstrate proficiency in advanced data constructs by analyzing business requirements and diagramming entities and relationships. – The student will be able to:

31.01 Validate that an attribute is properly placed based upon its dependence on its entity's unique identifier (UID).
31.02 Resolve many-to-many relationships with intersection entities.
31.03 Model advanced data constructs including recursive relationships, subtypes, and exclusive relationships.
31.04 Create exclusive entities and relationships by using subtypes and arcs, respectively.
31.05 Identify initial layout for presentation and generate a list of action items for members of group.
31.06 Develop an entity relationship model using subtypes, super-types and an exclusive arc.

32.0 Demonstrate proficiency in designing and adding complexity to an entity-relationship model (ERM). – The student will be able to:

32.01 Revise an entity relationship model according to the diagramming techniques covered in this course.
32.02 Define and give examples of hierarchical and recursive relationships.
32.03 Recognize and resolve fan traps and chasm traps.
32.04 Differentiate between transferable and non-transferable relationships.
32.05 Deliver a professional, formal business style presentation.

32.06 Evaluate and critique presentation layout, design and performance.
32.07 Construct a model using both recursion and hierarchies to express the same conceptual meaning.
32.08 Distinguish between using date as an attribute and DAY as an entity.

33.0 Apply complex ERM information by fine-tuning entities and the process for relating them. – The student will be able to:

33.01 Describe a relational database and how it differs from other database systems.
33.02 Define primary keys and foreign keys and describe their purpose.
33.03 Describe what data integrity refers to and list some constraints.
33.04 Explain how database design fits into the database development process.
33.05 Translate an entity-relationship model into a relational database design.
33.06 Document a database design using table instance charts.

34.0 Apply initial database design and normalization by following the set of house rules that determine how items are stored and retrieved. – The student will be able to:

34.01 Demonstrate ability to implement six steps for mapping entity relationship models.
34.02 Document an initial database design on table instance charts.
34.03 Recognize raw data and evaluate the steps for creating a data group in unnormalized form (UNF).

35.0 Demonstrate proficiency in the technique of normalization by labeling and organizing all items in a database in such a way as to prevent any confusion or mistakes. – The student will be able to:

35.01 Differentiate between unnormalized data and normalized.
35.02 Move data from an unnormalized form through to a third normal form.
35.03 Demonstrate ability to test data groups for third normal form compliance.
35.04 Identify optimized data groups from given groups of normalized data.

36.0 Demonstrate proficiency in table normalization by combining the techniques of an entity relationship model or a top-down, business approach to data with normalization or a bottom-up mathematical approach to data. – The student will be able to:

36.01 Compare the normalization and entity relationship modeling (ERM) techniques in terms of strengths and weaknesses.
36.02 Further define normalization and explain its benefits.
36.03 Place tables in third normal form.
36.04 Explain how conceptual data modeling rules ensure normalized tables.
36.05 Specify referential integrity constraints and design indices.

37.0 Apply blueprint principles to begin designing a tool for creating a web-based interface access to a database. – The student will be able to:

37.01 Evaluate the transformation of business requirements into an initial layout and design for a database.
37.02 Construct simple web page design for personal work folder.
37.03 Evaluate existing web sites and determine quality of design.

38.0 Extend the ERM presentation model by normalizing the data and mapping the management system. – The student will be able to:

38.01 Formulate a plan of action for the Database Project using skills previously learned in this course.
38.02 Normalize an ERM to the third normal form (TNF).
38.03 Create a table in the database using a database authoring tool.
38.04 Demonstrate ability to edit tables using a database authoring tool.
38.05 Create forms that will display the table components created with a database authoring tool.

39.0 Apply techniques for building a storage management system by creating a website using templates and wizards. – The student will be able to:

39.01 Create a web site that displays the database project home.
39.02 Link a web site to create a web-enabled interface to the industry database.
39.03 Edit the forms created and specify appropriate field labels for data entry.

40.0 Demonstrate storage closet design and functionality by constructing a group business presentation. – The student will be able to:

40.01 Evaluate and generate criteria for a formal, business presentation.
40.02 Construct a persuasive group presentation using the guidelines set forth in class.

41.0 Demonstrate comprehension of database modeling competency through group presentation. – The student will be able to:

41.01 Deliver a formal business presentation for the class that discusses an entity-relationship model and initial database design.
41.02 Demonstrate the functionality of the database and the layout/design capabilities of a database authoring tool.
41.03 Self-assess learning experience through the presentation and demonstration of their final database project.

42.0 Demonstrate comprehension that the database management software is a system for organizing the storage unit (or database) according to business needs and rules, through data integrity constraints. – The student will be able to:

42.01 Identify the structural elements of a relational database table.
42.02 List and describe the system development life cycle.
42.03 Describe the industry implementation of the relational database management system (RDBMS) and object relational database management system (ORDBMS).
42.04 Explain how SQL and languages that extend SQL are used in the industry product set.
42.05 Identify the advantages of a database management system.

43.0 Demonstrate comprehension of aspects of SQL language interface by writing basic SQL statements. – The student will be able to:

43.01 List the capabilities of SQL SELECT statements.
43.02 Execute a basic select statement.
43.03 Differentiate between SQL statements and language commands that extend SQL.

44.0 Demonstrate proficiency working with columns, characters, and rows in SQL. – The student will be able to:

44.01 Apply the concatenation operator to link columns to other columns, arithmetic expressions, or constant values to create a character expression.
44.02 Use column aliases to rename columns in the query result.
44.03 Eliminate duplicate rows in the query result.
44.04 Display the structure of a table.
44.05 Apply SQL syntax to restrict the rows returned from a query.
44.06 Demonstrate application of the WHERE clause syntax.
44.07 Construct and produce output using a SQL query containing character strings and date values.

45.0 Demonstrate proficiency in using SQL comparison operators. – The student will be able to:

45.01 Apply the proper comparison operator to return a desired result.
45.02 Demonstrate proper use of BETWEEN, IN, and LIKE conditions to return a desired result.
45.03 Distinguish between zero and the value of NULL as unavailable, unassigned, unknown, or inapplicable.
45.04 Explain the use of comparison conditions and NULL.

46.0 Demonstrate proficiency in using logical comparisons and precedence rules. – The student will be able to:

46.01 Evaluate logical comparisons to restrict the rows returned based on two or more conditions.
46.02 Apply the rules of precedence to determine the order in which expressions are evaluated and calculated.
46.03 Construct a query to order a results set for single or multiple columns.
46.04 Construct a query to sort a results set in ascending or descending order.

47.0 Demonstrate proficiency using SQL single row functions. – The student will be able to:

47.01 Perform calculations on data.
47.02 Modify individual data items.
47.03 Use character, number and date functions in SELECT statements.
47.04 Format data and numbers for display purposes.
47.05 Convert column data types.

48.0 Demonstrate proficiency displaying data from multiple tables. – The student will be able to:

48.01 Construct select statements to access data from more than one table using quality and non-equality joins.

48.02 Use outer joins through viewing data that generally does not meet a join condition.
48.03 Join a table to itself.

49.0 Demonstrate proficiency aggregating data using group functions. – The student will be able to:

49.01 Identify the available group functions and describe their use.
49.02 Demonstrate the ability to group data through the use of the GROUP BY clause.
49.03 Demonstrate the ability to include or exclude grouped rows by using the HAVING clause.

50.0 Demonstrate proficiency utilizing subqueries. – The student will be able to:

50.01 Write a query with an embedded subquery.
50.02 Evaluate and perform a multiple-column subquery.
50.03 Describe and explain the behavior of subqueries when null values are retrieved.
50.04 Create a subquery in a FROM clause.

51.0 Demonstrate proficiency producing readable output with SQL language interface, reporting tool, and data manipulation language. – The student will be able to:

51.01 Produce queries that require an input variable.
51.02 Customize the SQL language interface and reporting environment using SET commands for control.
51.03 Produce more readable output through the use of the column and break commands.
51.04 Describe data manipulation language (DML) and describe various DML statements.
51.05 Utilize data manipulation language (DML) through inserting, updating and deleting rows from a table.
51.06 Control transactions using COMMIT and ROLLBACK statements.

52.0 Demonstrate proficiency creating and managing database objects. – The student will be able to:

52.01 Describe the main database objects.
52.02 Create tables and alter their definitions.
52.03 Describe the data types that can be used when specifying column definition.

53.0 Demonstrate proficiency altering tables and constraints implementing views. – The student will be able to:

53.01 Create, drop, rename and truncate tables using SQL.
53.02 Identify and describe various constraints including not null, unique, primary key, foreign key, and check.
53.03 Create and maintain constraints including adding, dropping, enabling, disabling, and cascading.
53.04 Recognize views and explain how they are created, how they retrieve data and how they perform DML operations.

54.0 Demonstrate mastery of creating and implementing views, synonyms, indexes and other database objects. – The student will be able to:

54.01 Create views, retrieve data through a view, alter the definition of a view and drop a view.
54.02 Categorize information by using Top-N queries to retrieve specified data.
54.03 Identify the features of a sequence and display sequence values using a data dictionary view.
54.04 Identify the characteristics of a cached sequence.
54.05 Modify and remove a sequence using a SQL statement.
54.06 Identify the features of private and public synonyms.
54.07 Identify characteristics of an index and describe different types.
54.08 Create and remove an index using a SQL statement.

55.0 Demonstrate ability to control user access and SQL language interface and reporting tool. – The student will be able to:

55.01 Identify the features of database security.
55.02 Create users using SQL statements.
55.03 Grant and revoke object privileges using a SQL language interface and reporting tool.

56.0 Demonstrate comprehension of bundling features of SQL. – The student will be able to:

56.01 List and describe the benefits of extensions to SQL.
56.02 Recognize the basic SQL block and its sections.
56.03 Declare SQL variables and describe their significance.
56.04 Execute a SQL block.

57.0 Demonstrate comprehension working with composite data types by writing executable script files. – The student will be able to:

57.01 Recognize the significance of the executable section and decide when to use it.
57.02 Write statements in the executable section.
57.03 Describe the rules of nested blocks.
57.04 Identify and utilize appropriate coding conventions.
57.05 Create a script that will select, insert, and update data in a table.

125.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

125.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
125.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
125.03 Present information formally and informally for specific purposes and audiences. AF2.9

126.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

126.01 Demonstrate knowledge of arithmetic operations. AF3.2
126.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
126.03 Construct charts/tables/graphs using functions and data. AF3.5

127.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

127.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
127.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

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Specialized Database Programming – 150 Hours – SOC Code 15-1061

58.0 Describe the differences between SQL and PL/SQL. – The student will be able to:

58.01 Describe PL/SQL.
58.02 Differentiate between SQL and PL/SQL.
58.03 Explain the need for and benefits of PL/SQL.

59.0 Create PL/SQL blocks. – The student will be able to:

59.01 Describe the structure of a PL/SQL block.
59.02 Identify the different types of PL/SQL blocks.
59.03 Identify PL/SQL programming environments.
59.04 Create and execute an anonymous block.
59.05 Output messages in PL/SQL.

60.0 Use variables in PL/SQL. – The student will be able to:

60.01 Describe how variables are used in PL/SQL.
60.02 Identify the syntax for using variables.
60.03 Declare and initialize variables.
60.04 Assign new values to variables.

61.0 Recognize lexical units. – The student will be able to:

61.01 Describe the types of lexical units in PL/SQL.
61.02 Describe identifiers and identify valid and invalid identifiers.
61.03 Describe and identify reserved words, delimiters, literals, and comments.

62.0 Recognize data types. – The student will be able to:

62.01 Describe the data type categories.
62.02 Give examples of scalar, composite, and large object (LOB) data types.
62.03 Identify when an object becomes eligible for garbage collection.

63.0 Use scalar data types. – The student will be able to:

63.01 Declare and use scalar data types.
63.02 Define guidelines for declaring and initializing variables.
63.03 Describe the benefits of anchoring data types with the %TYPE attribute.

64.0 Use various types of JOINS. – The student will be able to:

64.01 Construct and execute SELECT statements using an equijoin.
64.02 Construct and execute SELECT statements using a non-equijoin.
64.03 Construct and execute SELECT statements using an outer join.
64.04 Construct and execute SELECT statements that result in a Cartesian product.

65.0 Use SQL group functions and subqueries. – The student will be able to:

65.01 Construct and execute an SQL query using group functions to determine a sum total, an average amount, and a maximum value.
65.02 Construct and execute an SQL query that groups data based on specified criteria.
65.03 Construct and execute an SQL query that contains a WHERE clause using a single-row subquery.
65.04 Construct and execute an SQL query that contains a WHERE clause using a multiple-row subquery.

66.0 Write PL/SQL executable statements. – The student will be able to:

66.01 Construct variable assignment statements.
66.02 Construct statements using built-in SQL functions.
66.03 Differentiate between implicit and explicit data type conversions.
66.04 Describe when implicit data type conversions take place.
66.05 List the drawbacks of implicit data type conversions.
66.06 Construct statements using functions to explicitly convert data types.
66.07 Construct statements using operators.

67.0 Use nested blocks and variable scope. – The student will be able to:

67.01 Understand the scope and visibility of variables.
67.02 Write nested blocks and qualify variables with labels.
67.03 Describe the scope of an exception.
67.04 Describe the effect of exception propagation in nested blocks.

68.0 Use good programming practices. – The student will be able to:

68.01 List examples of good programming practices.
68.02 Insert comments into PL/SQL code.
68.03 Follow formatting guidelines when writing code.

69.0 Write DML statements to manipulate data. – The student will be able to:

69.01 Construct and execute a DML statement to insert data into a table.
69.02 Construct and execute a DML statement to update data in a table.
69.03 Construct and execute a DML statement to delete data from a table.
69.04 Construct and execute a DML statement to merge data into a table.

70.0 Retrieve data using PL/SQL. – The student will be able to:

70.01 Identify SQL statements that can be directly included in an executable block.
70.02 Construct and execute an INTO clause to hold values returned by a single-row SELECT statement.
70.03 Construct statements that retrieve data.

71.0 Manipulate data using PL/SQL. – The student will be able to:

71.01 Construct and execute PL/SQL statements that manipulate data with DML statements.
71.02 Describe when to use implicit or explicit cursors.
71.03 Create code to use SQL implicit cursor attributes to evaluate cursor activity.

72.0 Use transaction control statements. – The student will be able to:

72.01 Define a transaction and give an example.
72.02 Construct and execute a transaction control statement.

73.0 Use IF conditional control statements. – The student will be able to:

73.01 Construct and use an IF statement.
73.02 Construct and use an IF-THEN-ELSIF-ELSE statement.
73.03 Create PL/SQL to handle null conditions in an IF statement.

74.0 Use CASE conditional control statements. – The student will be able to:

74.01 Construct and use CASE statements.
74.02 Construct and use CASE expressions.
74.03 Include syntax to handle null conditions in a CASE statement.
74.04 Include syntax to handle Boolean conditions in IF and CASE statements.

75.0 Use basic LOOP iterative control statements. – The student will be able to:

75.01 Describe the types of LOOP statements and their uses.
75.02 Create PL/SQL containing a basic loop and an EXIT statement.
75.03 Create PL/SQL containing a basic loop and an EXIT statement with conditional termination.

76.0 Use WHILE and FOR loop iterative control statements. – The student will be able to:

76.01 Construct and use the WHILE looping construct.
76.02 Construct and use the FOR looping construct.
76.03 Describe when a WHILE loop is used.
76.04 Describe when a FOR loop is used.

77.0 Use nested loop iterative control statements. – The student will be able to:

77.01 Construct and execute PL/SQL using nested loops.
77.02 Evaluate a nested loop construct and identify the exit point.

78.0 Use explicit cursors. – The student will be able to:

78.01 List the guidelines for declaring and controlling explicit cursors.
78.02 Create PL/SQL code to open a cursor and fetch a piece of data into a variable.
78.03 Use a simple loop to fetch multiple rows from a cursor.
78.04 Create PL/SQL code to close a cursor.

79.0 Use explicit cursor attributes. – The student will be able to:

79.01 Define a record structure using the %ROWTYPE attribute.
79.02 Create PL/SQL code to process the row of an active set using record types in cursors.
79.03 Use cursor attributes to retrieve information about the state of an explicit cursor.

80.0 Use cursor FOR loops. – The student will be able to:

80.01 List and explain the benefits of using Cursor FOR loops.
80.02 Create PL/SQL code to declare a cursor and manipulate it in a FOR loop.
80.03 Create PL/SQL code containing a Cursor FOR loop using a subquery.

81.0 Use cursors with parameters. – The student will be able to:

81.01 List the benefits of using parameters with cursors.
81.02 Create PL/SQL code to declare and manipulate a cursor with a parameter.

82.0 Use cursors for update transactions. – The student will be able to:

82.01 Create PL/SQL code to lock rows before an update using the appropriate clause.
82.02 Explain the effect of using NOWAIT in an update cursor declaration.
82.03 Create PL/SQL code to use the current row of the cursor in an UPDATE or DELETE statement.

83.0 Use multiple cursors. – The student will be able to:

83.01 Explain the need for using multiple cursors to produce multilevel reports.
83.02 Create PL/SQL code to declare and manipulate multiple cursors within nested loops.
83.03 Create PL/SQL code to declare and manipulate multiple cursors using parameters.

84.0 Handle exceptions. – The student will be able to:

84.01 Describe the advantages of including exception handling code.
84.02 Describe the purpose of an EXCEPTION section in a PL/SQL block.
84.03 Create PL/SQL code to include an EXCEPTION section.
84.04 List the guidelines for exception handling.

85.0 Trap Oracle server exceptions. – The student will be able to:

85.01 Distinguish between errors defined by the Oracle Server and those defined by the programmer.
85.02 Differentiate between errors that are handled implicitly and explicitly by the Oracle Server.

85.03 Write PL/SQL code to trap a predefined Oracle Server error.
85.04 Write PL/SQL code to trap a non-predefined Oracle Server error.
85.05 Write PL/SQL code to identify an exception by error code and by error message.

86.0 Trap user-defined exceptions. – The student will be able to:

86.01 Write PL/SQL code to name a user-defined exception.
86.02 Write PL/SQL code to raise an exception.
86.03 Write PL/SQL code to handle a raised exception.
86.04 Write PL/SQL code to use RAISE_APPLICATION_ERROR.

87.0 Create procedures. – The student will be able to:

87.01 Differentiate between anonymous blocks and subprograms.
87.02 Identify the benefits of using subprograms.
87.03 Describe a stored procedure.
87.04 Create a procedure.
87.05 Describe how a stored procedure is invoked.

88.0 Use parameters in procedures. – The student will be able to:

88.01 Describe how parameters contribute to a procedure.
88.02 Define a parameter.
88.03 Create a procedure using a parameter.
88.04 Invoke a procedure that has parameters.
88.05 Distinguish between formal and actual parameters.

89.0 Pass parameters. – The student will be able to:

89.01 List the types of parameter modes.
89.02 Create a procedure that passes parameters.
89.03 Identify three methods for passing parameters.
89.04 Describe the DEFAULT option for parameters.

90.0 Create stored functions. – The student will be able to:

90.01 Describe the difference between a stored procedure and a stored function.
90.02 Create a PL/SQL block containing a function.
90.03 Identify ways in which functions may be invoked.
90.04 Create a PL/SQL block that invokes a function that has parameters.

91.0 Use functions in SQL statements. – The student will be able to:

91.01 Describe where user-defined functions can be called from within an SQL statement.
91.02 Describe the restrictions on calling functions from SQL statements.
91.03 Describe the purpose of the Data Dictionary.
91.04 Differentiate between the three types of Data Dictionary views.
91.05 Write SQL SELECT statements to retrieve information from the Data Dictionary.
91.06 Explain the use of DICTIONARY as a Data Dictionary search engine.

92.0 Manage procedures and functions. – The student will be able to:

92.01 Describe how exceptions are propagated.
92.02 Remove a function and a procedure.
92.03 Use Data Dictionary views to identify and manage stored procedures.

93.0 Manage object privileges. – The student will be able to:

93.01 List and explain several object privileges.
93.02 Explain the function of the EXECUTE object privilege.
93.03 Write SQL statements to grant and revoke object privileges.

94.0 Use invoker's rights. – The student will be able to:

94.01 Contrast invoker's rights with definer's rights.
94.02 Create a procedure that uses invoker's rights.

95.0 Create packages. – The student will be able to:

95.01 Describe a package, its components, and the reasons for use.
95.02 Create packages containing related variables, cursors, constants, exceptions, procedures, and functions.
95.03 Create a PL/SQL block that invokes a package construct.

96.0 Manage package constructs. – The student will be able to:

96.01 Explain the difference between public and private package constructs.
96.02 Designate a package construct as either public or private.
96.03 Specify the syntax to drop a package.
96.04 Identify Data Dictionary views used to manage packages.
96.05 Identify the guidelines for using packages.

97.0 Use advanced package concepts. – The student will be able to:

97.01 Write packages that use the overloading feature.
97.02 Write packages that use forward declarations.
97.03 Explain the purpose of a package initialization block.
97.04 Identify restrictions on using packaged functions in SQL statements.

98.0 Manage persistent state of package variables. – The student will be able to:

98.01 Identify persistent states of package variables.
98.02 Control the persistent state of a package cursor.

99.0 Use Oracle-supplied packages. – The student will be able to:

99.01 Describe two common uses for the DBMS_OUTPUT package.
99.02 Use the syntax to specify messages for the DBMS_OUTPUT package.
99.03 Describe the purpose for the UTL_FILE package.
99.04 Identify the exceptions used in conjunction with the UTL_FILE package.

100.0 Understand dynamic SQL. – The student will be able to:

100.01 Identify the stages through which all SQL statements pass.
100.02 Describe the reasons for using dynamic SQL to create an SQL statement.
100.03 List four PL/SQL statements supporting Native Dynamic SQL.
100.04 Describe the benefits of Execute Immediate over DBMS_SQL for Dynamic SQL.

101.0 Understand triggers. – The student will be able to:

101.01 Describe database triggers and their uses.
101.02 Differentiate between a database trigger and an application trigger.
101.03 List the guidelines for using triggers.
101.04 Compare and contrast database triggers and stored procedures.

102.0 Create DML triggers. – The student will be able to:

102.01 Create a DML trigger and identify its components.
102.02 Create a statement level trigger.
102.03 Describe the trigger firing sequence options.
102.04 Create a DML trigger that uses conditional predicates.
102.05 Create a row level trigger.
102.06 Create a row level trigger that uses OLD and NEW qualifiers.
102.07 Create an INSTEAD OF trigger.

103.0 Create DDL and database event triggers. – The student will be able to:

103.01 Describe the events that cause DDL and database event triggers to fire.
103.02 Create a trigger for a DDL statement.
103.03 Create a trigger for a database event.
103.04 Describe the functionality of the CALL statement.
103.05 Describe the cause of a mutating table.

104.0 Manage triggers. – The student will be able to:

104.01 View trigger information in the Data Dictionary.
104.02 Disable and enable a database trigger.
104.03 Remove a trigger from the database.

105.0 Use large object data types. – The student will be able to:

105.01 Compare and contrast LONG and LOB data types.
105.02 Describe LOB data types and how they are used.
105.03 Differentiate between internal and external LOBs.
105.04 Create and maintain LOB data types.
105.05 Migrate data from LONG to LOB.

106.0 Manage BFILEs. – The student will be able to:

106.01 Define BFILEs and the BFILE column data type.
106.02 Create directory objects and view them in the Data Dictionary.
106.03 Manage and manipulate BFILEs using BFILENAME and DBMS_LOB.

107.0 Manage indexes. – The student will be able to:

107.01 Create and manipulate user-defined PL/SQL records.
107.02 Create an INDEX BY table.
107.03 Create an INDEX BY table of records.
107.04 Describe the difference between records, tables, and tables of records.

108.0 Manage dependencies. – The student will be able to:

108.01 Describe the implications of procedural dependencies.
108.02 Contrast dependent objects and referenced objects.
108.03 View dependency information in the Data Dictionary.
108.04 Use the UTLDTREE script to create the objects required to display dependencies.
108.05 Use the IDEPTREE and DEPTREE views to display dependencies.
108.06 Describe when automatic recompilation occurs.
108.07 Describe how to minimize dependency failures.

128.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

128.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
128.02 Locate, organize and reference written information from various sources. CM 3.0
128.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
128.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
128.05 Apply active listening skills to obtain and clarify information. CM 7.0
128.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
128.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

129.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

129.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
129.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
129.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
129.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

130.0 Use information technology tools. – The student will be able to:

130.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
130.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0

130.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
130.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

131.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

131.01 Describe the nature and types of business organizations. SY 1.0
131.02 Explain the effect of key organizational systems on performance and quality.
131.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
131.04 Explain the impact of the global economy on business organizations.

134.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

134.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
134.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
134.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
134.04 Interpret and explain written organizational policies and procedures. ELR 2.0

Course Number: CTS0067
Occupational Completion Point – A
Specialized Database Applications – 150 Hours – SOC Code 15-1061

109.0 Program a database application. – The student will be able to:

109.01 Utilize loop statements.
109.02 Given a scenario, use arithmetic, comparison, and pattern-matching operators.
109.03 Create user-defined functions.
109.04 Utilize common built-in functions.
109.05 Declare variables in modules and procedures.
109.06 Declare arrays, and initialize elements of arrays.
109.07 Declare and use object variables and collections, and use their associated properties and methods.
109.08 Declare symbolic constants, and make them available locally or publicly.
109.09 Respond to events.

110.0 Utilize the basic concepts of database design. – The student will be able to:

110.01 Apply basic concepts of normalization.
110.02 Utilize the cascade update and cascade delete options.

111.0 Utilize SQL and UNION queries. – The student will be able to:

111.01 Utilize SQL to write common queries.
111.02 Refer to objects by using SQL.
111.03 Utilize UNION queries.

112.0 Implement program statements using objects. – The student will be able to:

112.01 Determine when to use data access objects.
112.02 Differentiate between objects and collections.
112.03 Write statements that access and modify database objects.
112.04 Utilize data access objects.
112.05 Select appropriate methods and property settings for use with specified objects.

113.0 Utilize debugging tools and write error handlers. – The student will be able to:

113.01 Trap errors.
113.02 Utilize debugging tools to suspend program execution, and to examine, step through, and reset execution of code.
113.03 Debug code samples.
113.04 Utilize the Debugger to monitor variable values.
113.05 Write an error handler.

114.0 Demonstrate file I/O. – The student will be able to:

114.01 Read from files.
114.02 Write to files.
114.03 Utilize record locking.

115.0 Create forms and identify all the properties of a form. – The student will be able to:

115.01 Choose form-specific and report-specific properties to set.
115.02 Choose control properties to set.
115.03 Assign event-handling procedures to controls in a form.
115.04 Define and create form and report modules.
115.05 Identify the scope of a form or report module.
115.06 Open multiple instances of a form, and refer to them.
115.07 Assign values to form properties.
115.08 Use form methods.

116.0 Manipulate data using object models. – The student will be able to:

116.01 Connect to a data source.
116.02 Open a recordset.
116.03 Insert, update, delete and find data.

117.0 Develop custom controls. – The student will be able to:

117.01 Set properties for custom controls.
117.02 Customize user interface controls.

118.0 Utilize API functions. – The student will be able to:

118.01 Properly declare functions.
118.02 Use the by value and by reference parameters.

119.0 Demonstrate database replication and implement database replication using programming tools. – The student will be able to:

119.01 Make a database replicable.
119.02 View a synchronization schedule.
119.03 Explain the purpose of the Replication ID.
119.04 Explain how synchronization conflicts are resolved.
119.05 Identify the advantages of using replication of synchronization.
119.06 Identify the changes that the database engine makes when it converts a nonreplicable database into replicable database.

120.0 Analyze and implement security options. – The student will be able to:

120.01 Analyze a scenario, and recommend an appropriate type of security.
120.02 Explain the steps for implementing security.
120.03 Analyze code to ensure that it sets security options.
120.04 Write code to implement security options.

121.0 Implement client/server applications. – The student will be able to:

121.01 Demonstrate SQL pass through queries and application queries.
121.02 Access external data by using ODBC.
121.03 Trap errors that are generated by the server.
121.04 Optimize connections.
121.05 Optimize performance for a given client/server application.

122.0 Optimize the performance of a database. – The student will be able to:

122.01 Differentiate between single-field and multiple-field indexes.
122.02 Optimize queries.
122.03 Restructure queries to allow faster execution.
122.04 Optimize performance in distributed applications.
122.05 Optimize performance for client/server applications.

123.0 Perform application distribution. – The student will be able to:

123.01 Prepare an application for distribution.
123.02 Analyze various methods to distribute a client/server application.
123.03 Distribute custom controls with an application.
123.04 Provide online help.

124.0 Test and debug databases. – The student will be able to:

124.01 Implement error handling.
124.02 Test and debug library databases.

132.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

132.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0

132.02 Explain emergency procedures to follow in response to workplace accidents.
132.03 Create a disaster and/or emergency response plan. SHE 2.0

133.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

133.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
133.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
133.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
133.04 Employ mentoring skills to inspire and teach others. LT 5.0

135.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

135.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
135.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
135.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
135.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
135.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
135.06 Identify and exhibit traits for retaining employment. ECD 7.0
135.07 Identify opportunities and research requirements for career advancement. ECD 8.0
135.08 Research the benefits of ongoing professional development. ECD 9.0
135.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

136.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

136.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
136.02 Describe the effect of money management on personal and career goals. FL 3.0
136.03 Develop a personal budget and financial goals. FL3.1
136.04 Complete financial instruments for making deposits and withdrawals. FL3.2
136.05 Maintain financial records. FL3.3
136.06 Read and reconcile financial statements. FL3.4
136.07 Research, compare and contrast investment opportunities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Keyboarding and Business Skills**
Course Number: **8200320**
Course Credit: **.5**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental word processing applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society.

This course, along with Computer and Business Skills is equivalent to Computing for College and Careers. Students should complete this course before enrolling in Computer and Business Skills.

10.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 10.01 Develop keyboarding skills to enter and manipulate text and data.
- 10.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 10.03 Demonstrate basic file management skills.

11.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 11.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 11.02 Write clear and well-organized research papers, integrating a variety of information.
- 11.03 Prepare and deliver an oral report with appropriate materials to the class
- 11.04 Participate in large group discussions as a member and/or a leader.
- 11.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 11.06 Accurately follow written and oral instructions.
- 11.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

12.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 12.01 Select and use word processing software and accompanying features to enhance written business communications.
- 12.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.

12.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

13.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

13.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
13.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
13.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

14.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

14.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
14.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

15.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

15.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
15.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
15.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

16.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

16.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
16.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.

16.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
16.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

17.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

17.01 Accept constructive criticism.
17.02 Apply appropriate strategies to manage and resolve conflict in work situations.
17.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

18.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
18.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer and Business Skills**
Course Number: **8200330**
Course Credit: **.5**

Course Description:

This course is designed to introduce students to the basic skills and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

This course, along with Keyboarding and Business Skills is equivalent to Computing for College and Careers. Students should complete Keyboarding and Business Skills before enrolling in this course.

14.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 14.01 Develop keyboarding skills to enter and manipulate text and data.
- 14.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 14.03 Identify and describe communications and networking systems used in workplace environments.
- 14.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 14.05 Demonstrate basic file management skills.
- 14.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
- 14.07 Describe ethical issues and problems associated with computers and information systems.
- 14.08 Apply ergonomic principles applicable to the configuration of computer workstations.

15.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

- 15.01 Take notes, organize, summarize, and paraphrase ideas and details.
- 15.02 Accurately follow written and oral instructions.
- 15.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

16.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

16.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
16.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
16.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

17.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

17.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
17.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

18.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
18.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
18.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

19.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

19.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
19.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
19.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

20.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

20.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
20.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

20.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

21.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

21.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
21.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
21.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
21.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
21.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
21.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
21.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
21.08 Build mentor relationships with local professionals in the industry.

22.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

22.01 Accept constructive criticism.
22.02 Apply appropriate strategies to manage and resolve conflict in work situations.
22.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

23.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

23.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

24.0 Perform e-mail activities. – The student will be able to:

24.01 Describe e-mail capabilities and functions.
24.02 Use the Internet to perform e-mail activities.

25.0 Demonstrate operating systems. – The student will be able to:

25.01 Identify operating system file naming conventions.

25.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
25.03 Demonstrate a working knowledge of standard file formats.
25.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

26.0 Develop an awareness of emerging technologies. – The student will be able to:

26.01 Compare and contrast various methods of evaluation for emerging technologies.
26.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
26.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computing for College and Careers**
Course Number: **8209020**
Course Credit: **1**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society. This also includes proficiency with computers using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Demonstrate basic computer file management skills.
- 01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.07 Describe ethical issues and problems associated with computers and information systems.
- 01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills. – The student will be able to:

- 03.01 Select and use word processing software and accompanying features to enhance written business communications.
- 03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
- 03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
- 03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
- 03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles. – The student will be able to:

- 04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
- 04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
- 04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

- 05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
- 05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

- 06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
- 06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
- 06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance. – The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up).
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace. – The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities. –The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems. –The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies. – The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Introduction to Information Technology**
Course Number: **8207310**
Course Credit: **1**

Course Description:

This course is designed to provide an introduction to information technology concepts and careers as well as the impact information technology has on the world, people, and industry and basic web design concepts. The content includes information technology career research; operating systems and software applications; electronic communications including e-mail and Internet services; basic HTML, DHTML, and XML web commands and design; and emerging technologies and web page design.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills. – The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance. – The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace. – The student will be able to:

10.01 Accept constructive criticism.
10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences. – The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities. – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.
12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.

12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems. – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW. – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using HTML commands. – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the WWW. – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software. – The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry. – The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers. – The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages. – The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies. – The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the open systems interface (OSI) model. – The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications. – The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications. – The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Database Fundamentals**
Course Number: **8206410**
Course Credit: **.5**

Course Description:

This data modeling course is designed to provide the foundation for future software engineers or database administrators. It transforms business requirements into an operational database utilizing a top-down systematic approach. Content includes creation of entity-relationship diagrams that accurately model an organization's needs and support the functions of a business, mapping of information needs into a relational database design, creation of physical relational database tables to implement database design, construction of a website that interacts with a database and generates report using web-based reports, and organization and composition of formal presentations, integrating multimedia software.

25.0 Develop an awareness of the changes taking place in the information age and how they fit into an evolving society. – The student will be able to:

- 25.01 Cite examples of jobs, salary, and opportunities he/she will have as a result of participating in the Academy.
- 25.02 Describe the role a database plays in a business and predict its evolution.
- 25.03 Demonstrate the difference between "data" and "information."
- 25.04 Understand the importance of clear communication when discussing business informational requirements.
- 25.05 Identify important historical contributions in database development and design.

26.0 Develop the "big picture" of database design and how to best organize data according to business rules and/or client needs. – The student will be able to:

- 26.01 Identify and analyze the phases of the database development process.
- 26.02 Explain what conceptual data modeling and database design involve.
- 26.03 Compare database development Process with that of the application development process.
- 26.04 Distinguish between a conceptual model and a physical implementation.

27.0 Develop the process of creating an entity by identifying relationships. – The student will be able to:

- 27.01 Identify and model various types of entities.
- 27.02 Identify naming and drawing conventions for entities.
- 27.03 Sequence the steps that are necessary for creation of an entity.
- 27.04 Analyze and model the relationships between entities.

28.0 Formulate and assemble initial entity relationship by expanding on modeling concepts. – The student will be able to:

- 28.01 Analyze and model attributes.

28.02 Identify unique identifiers for each entity.
28.03 Develop an entity relationship diagram tagging attributes with optionality.

29.0 Consider the degree and optionality of relationships of entities. – The student will be able to:

29.01 Create entity relationship models based on information requirements and interviews.
29.02 Differentiate between one-to-many, many-to-many and one-to-one relationships.
29.03 Identify relationship between two entities by reading a given diagram.
29.04 Create a relationship between instances of the same entity.
29.05 Read an entity relationship model in order to validate it.

30.0 Demonstrate proficiency in early construction stages of the data modeling process by using unique identifiers and many-to-many (M:M) relationships for building entity relationship diagrams. – The student will be able to:

30.01 Identify the significance of an attribute that has more than one value for each entity instance.
30.02 Evaluate appropriate methods of storing validation rules for attributes.
30.03 Recognize unique identifiers inherited from other entities.
30.04 Sequence the steps involved in resolving a many-to-many relationship.

31.0 Demonstrate proficiency in advanced data constructs by analyzing business requirements and diagramming entities and relationships. – The student will be able to:

31.01 Validate that an attribute is properly placed based upon its dependence on its entity's unique identifier (UID).
31.02 Resolve many-to-many relationships with intersection entities.
31.03 Model advanced data constructs including recursive relationships, subtypes, and exclusive relationships.
31.04 Create exclusive entities and relationships by using subtypes and arcs, respectively.
31.05 Identify initial layout for presentation and generate a list of action items for members of group.
31.06 Develop an entity relationship model using subtypes, super-types and an exclusive arc.

32.0 Demonstrate proficiency in designing and adding complexity to an entity-relationship model (ERM). – The student will be able to:

32.01 Revise an entity relationship model according to the diagramming techniques covered in this course.
32.02 Define and give examples of hierarchical and recursive relationships.
32.03 Recognize and resolve fan traps and chasm traps.
32.04 Differentiate between transferable and non-transferable relationships.
32.05 Deliver a professional, formal business style presentation.
32.06 Evaluate and critique presentation layout, design and performance.
32.07 Construct a model using both recursion and hierarchies to express the same conceptual meaning.
32.08 Distinguish between using date as an attribute and DAY as an entity.

33.0 Apply complex ERM information by fine-tuning entities and the process for relating them. – The student will be able to:

33.01 Describe a relational database and how it differs from other database systems.
33.02 Define primary keys and foreign keys and describe their purpose.
33.03 Describe what data integrity refers to and list some constraints.
33.04 Explain how database design fits into the database development process.
33.05 Translate an entity-relationship model into a relational database design.
33.06 Document a database design using table instance charts.

34.0 Apply initial database design and normalization by following the set of house rules that determine how items are stored and retrieved. – The student will be able to:

34.01 Demonstrate ability to implement six steps for mapping entity relationship models.
34.02 Document an initial database design on table instance charts.
34.03 Recognize raw data and evaluate the steps for creating a data group in unnormalized form (UNF).

35.0 Demonstrate proficiency in the technique of normalization by labeling and organizing all items in a database in such a way as to prevent any confusion or mistakes. – The student will be able to:

35.01 Differentiate between unnormalized data and normalized.
35.02 Move data from an unnormalized form through to a third normal form.
35.03 Demonstrate ability to test data groups for third normal form compliance.
35.04 Identify optimized data groups from given groups of normalized data.

36.0 Demonstrate proficiency in table normalization by combining the techniques of an entity relationship model or a top-down, business approach to data with normalization or a bottom-up mathematical approach to data. – The student will be able to:

36.01 Compare the normalization and entity relationship modeling (ERM) techniques in terms of strengths and weaknesses.
36.02 Further define normalization and explain its benefits.
36.03 Place tables in third normal form.
36.04 Explain how conceptual data modeling rules ensure normalized tables.
36.05 Specify referential integrity constraints and design indices.

37.0 Apply blueprint principles to begin designing a tool for creating a web-based interface access to a database. – The student will be able to:

37.01 Evaluate the transformation of business requirements into an initial layout and design for a database.
37.02 Construct simple web page design for personal work folder.
37.03 Evaluate existing web sites and determine quality of design.

38.0 Extend the ERM presentation model by normalizing the data and mapping the management system. – The student will be able to:

38.01 Formulate a plan of action for the Database Project using skills previously learned in this course.
38.02 Normalize an ERM to the third normal form (TNF).
38.03 Create a table in the database using a database authoring tool.
38.04 Demonstrate ability to edit tables using a database authoring tool.
38.05 Create forms that will display the table components created with a database authoring tool.

39.0 Apply techniques for building a storage management system by creating a website using templates and wizards. – The student will be able to:

39.01 Create a web site that displays the database project home.
39.02 Link a web site to create a web-enabled interface to the industry database.
39.03 Edit the forms created and specify appropriate field labels for data entry.

40.0 Demonstrate storage closet design and functionality by constructing a group business presentation. – The student will be able to:

40.01 Evaluate and generate criteria for a formal, business presentation.
40.02 Construct a persuasive group presentation using the guidelines set forth in class.

41.0 Demonstrate comprehension of database modeling competency through group presentation. – The student will be able to:

41.01 Deliver a formal business presentation for the class that discusses an entity-relationship model and initial database design.
41.02 Demonstrate the functionality of the database and the layout/design capabilities of a database authoring tool.
41.03 Self-assess learning experience through the presentation and demonstration of their final database project.

125.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

125.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
125.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
125.03 Present information formally and informally for specific purposes and audiences. AF2.9

126.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

126.01 Demonstrate knowledge of arithmetic operations. AF3.2
126.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
126.03 Construct charts/tables/graphs using functions and data. AF3.5

127.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

127.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
127.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Data Control and Functions**
Course Number: **8206420**
Course Credit: **.5**

Course Description:

This course introduces data-server technology. Structured Query Language (SQL) is the standardized language that creates a medium for companies to compete in the building of databases or data management systems. Content of this course includes creation and maintenance of database objects and storage, retrieval and manipulation of data using SQL and Programming Language (PL) PL/SQL programming languages. At the completion of Database Fundamentals and Data Control and Functions, students will be able to create blocks of application code that can be shared by multiple forms, reports and data management applications and to sit for the first of two certification exams.

42.0 Demonstrate comprehension that the database management software is a system for organizing the storage unit (or database) according to business needs and rules, through data integrity constraints. – The student will be able to:

- 42.01 Identify the structural elements of a relational database table.
- 42.02 List and describe the system development life cycle.
- 42.03 Describe the industry implementation of the relational database management system (RDBMS) and object relational database management system (ORDBMS).
- 42.04 Explain how SQL and languages that extend SQL are used in the industry product set.
- 42.05 Identify the advantages of a database management system.

43.0 Demonstrate comprehension of aspects of SQL language interface by writing basic SQL statements. – The student will be able to:

- 43.01 List the capabilities of SQL SELECT statements.
- 43.02 Execute a basic select statement.
- 43.03 Differentiate between SQL statements and language commands that extend SQL.

44.0 Demonstrate proficiency working with columns, characters, and rows in SQL. – The student will be able to:

- 44.01 Apply the concatenation operator to link columns to other columns, arithmetic expressions, or constant values to create a character expression.
- 44.02 Use column aliases to rename columns in the query result.
- 44.03 Eliminate duplicate rows in the query result.
- 44.04 Display the structure of a table.
- 44.05 Apply SQL syntax to restrict the rows returned from a query.
- 44.06 Demonstrate application of the WHERE clause syntax.

44.07 Construct and produce output using a SQL query containing character strings and date values.

45.0 Demonstrate proficiency in using SQL comparison operators. – The student will be able to:

45.01 Apply the proper comparison operator to return a desired result.
45.02 Demonstrate proper use of BETWEEN, IN, and LIKE conditions to return a desired result.
45.03 Distinguish between zero and the value of NULL as unavailable, unassigned, unknown, or inapplicable.
45.04 Explain the use of comparison conditions and NULL.

46.0 Demonstrate proficiency in using logical comparisons and precedence rules. – The student will be able to:

46.01 Evaluate logical comparisons to restrict the rows returned based on two or more conditions.
46.02 Apply the rules of precedence to determine the order in which expressions are evaluated and calculated.
46.03 Construct a query to order a results set for single or multiple columns.
46.04 Construct a query to sort a results set in ascending or descending order.

47.0 Demonstrate proficiency using SQL single row functions. – The student will be able to:

47.01 Perform calculations on data.
47.02 Modify individual data items.
47.03 Use character, number and date functions in SELECT statements.
47.04 Format data and numbers for display purposes.
47.05 Convert column data types.

48.0 Demonstrate proficiency displaying data from multiple tables. – The student will be able to:

48.01 Construct select statements to access data from more than one table using quality and non-equality joins.
48.02 Use outer joins through viewing data that generally does not meet a join condition.
48.03 Join a table to itself.

49.0 Demonstrate proficiency aggregating data using GROUP functions. – The student will be able to:

49.01 Identify the available group functions and describe their use.
49.02 Demonstrate the ability to group data through the use of the GROUP BY clause.
49.03 Demonstrate the ability to include or exclude grouped rows by using the HAVING clause.

50.0 Demonstrate proficiency utilizing subqueries. – The student will be able to:

50.01 Write a query with an embedded subquery.

50.02 Evaluate and perform a multiple-column subquery.
50.03 Describe and explain the behavior of subqueries when null values are retrieved.
50.04 Create a subquery in a FROM clause.

51.0 Demonstrate proficiency producing readable output with SQL language interface, reporting tool, and data manipulation language. – The student will be able to:

51.01 Produce queries that require an input variable.
51.02 Customize the SQL language interface and reporting environment using SET commands for control.
51.03 Produce more readable output through the use of the column and break commands.
51.04 Describe data manipulation language (DML) and describe various DML statements.
51.05 Utilize data manipulation language (DML) through inserting, updating and deleting rows from a table.
51.06 Control transactions using COMMIT and ROLLBACK statements.

52.0 Demonstrate proficiency creating and managing database objects. – The student will be able to:

52.01 Describe the main database objects.
52.02 Create tables and alter their definitions.
52.03 Describe the data types that can be used when specifying column definition.

53.0 Demonstrate proficiency altering tables and constraints implementing views. – The student will be able to:

53.01 Create, drop, rename and truncate tables using SQL.
53.02 Identify and describe various constraints including not null, unique, primary key, foreign key, and check.
53.03 Create and maintain constraints including adding, dropping, enabling, disabling, and cascading.
53.04 Recognize views and explain how they are created, how they retrieve data and how they perform DML operations.

54.0 Demonstrate mastery of creating and implementing views, synonyms, indexes and other database objects. – The student will be able to:

54.01 Create views, retrieve data through a view, alter the definition of a view and drop a view.
54.02 Categorize information by using Top-N queries to retrieve specified data.
54.03 Identify the features of a sequence and display sequence values using a data dictionary view.
54.04 Identify the characteristics of a cached sequence.
54.05 Modify and remove a sequence using a SQL statement.
54.06 Identify the features of private and public synonyms.
54.07 Identify characteristics of an index and describe different types.
54.08 Create and remove an index using a SQL statement.

55.0 Demonstrate ability to control user access and SQL language interface and reporting tool. – The student will be able to:

55.01 Identify the features of database security.
55.02 Create users using SQL statements.
55.03 Grant and revoke object privileges using a SQL language interface and reporting tool.

56.0 Demonstrate comprehension of bundling features of SQL. – The student will be able to:

56.01 List and describe the benefits of extensions to SQL.
56.02 Recognize the basic SQL block and its sections.
56.03 Declare SQL variables and describe their significance.
56.04 Execute a SQL block.

57.0 Demonstrate comprehension working with composite data types by writing executable script files. – The student will be able to:

57.01 Recognize the significance of the executable section and decide when to use it.
57.02 Write statements in the executable section.
57.03 Describe the rules of nested blocks.
57.04 Identify and utilize appropriate coding conventions.
57.05 Create a script that will select, insert, and update data in a table.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Specialized Database Programming**
Course Number: **8206430**
Course Credit: **1**

Course Description:

This course covers PL/SQL, a procedural language extension to SQL. Through an innovative project-based approach, students learn procedural logic constructs such as variables, constants, conditional statements, and iterative controls. After completing this course, the student will have the opportunity to sit for the second of two exams required to earn the Oracle Certified Associate certification and the student will be able to:

58.0 Describe the differences between SQL and PL/SQL. – The student will be able to:

- 58.01 Describe PL/SQL.
- 58.02 Differentiate between SQL and PL/SQL.
- 58.03 Explain the need for and benefits of PL/SQL.

59.0 Create PL/SQL blocks. – The student will be able to:

- 59.01 Describe the structure of a PL/SQL block.
- 59.02 Identify the different types of PL/SQL blocks.
- 59.03 Identify PL/SQL programming environments.
- 59.04 Create and execute an anonymous block.
- 59.05 Output messages in PL/SQL.

60.0 Use variables in PL/SQL. – The student will be able to:

- 60.01 Describe how variables are used in PL/SQL.
- 60.02 Identify the syntax for using variables.
- 60.03 Declare and initialize variables.
- 60.04 Assign new values to variables.

61.0 Recognize lexical units. – The student will be able to:

- 61.01 Describe the types of lexical units in PL/SQL.
- 61.02 Describe identifiers and identify valid and invalid identifiers.
- 61.03 Describe and identify reserved words, delimiters, literals, and comments.

62.0 Recognize data types. – The student will be able to:

- 62.01 Describe the data type categories.
- 62.02 Give examples of scalar, composite, and large object (LOB) data types.
- 62.03 Identify when an object becomes eligible for garbage collection.

63.0 Use scalar data types. – The student will be able to:

63.01 Declare and use scalar data types.
63.02 Define guidelines for declaring and initializing variables.
63.03 Describe the benefits of anchoring data types with the %TYPE attribute.

64.0 Use various types of joins. – The student will be able to:

64.01 Construct and execute SELECT statements using an equijoin.
64.02 Construct and execute SELECT statements using a non-equijoin.
64.03 Construct and execute SELECT statements using an outer join.
64.04 Construct and execute SELECT statements that result in a Cartesian product.

65.0 Use SQL group functions and subqueries. – The student will be able to:

65.01 Construct and execute an SQL query using group functions to determine a sum total, an average amount, and a maximum value.
65.02 Construct and execute an SQL query that groups data based on specified criteria.
65.03 Construct and execute an SQL query that contains a WHERE clause using a single-row subquery.
65.04 Construct and execute an SQL query that contains a WHERE clause using a multiple-row subquery.

66.0 Write PL/SQL executable statements. – The student will be able to:

66.01 Construct variable assignment statements.
66.02 Construct statements using built-in SQL functions.
66.03 Differentiate between implicit and explicit data type conversions.
66.04 Describe when implicit data type conversions take place.
66.05 List the drawbacks of implicit data type conversions.
66.06 Construct statements using functions to explicitly convert data types.
66.07 Construct statements using operators.

67.0 Use nested blocks and variable scope. – The student will be able to:

67.01 Understand the scope and visibility of variables.
67.02 Write nested blocks and qualify variables with labels.
67.03 Describe the scope of an exception.
67.04 Describe the effect of exception propagation in nested blocks.

68.0 Use good programming practices. – The student will be able to:

68.01 List examples of good programming practices.
68.02 Insert comments into PL/SQL code.
68.03 Follow formatting guidelines when writing code.

69.0 Write DML statements to manipulate data. – The student will be able to:

69.01 Construct and execute a DML statement to insert data into a table.
69.02 Construct and execute a DML statement to update data in a table.
69.03 Construct and execute a DML statement to delete data from a table.
69.04 Construct and execute a DML statement to merge data into a table.

70.0 Retrieve data using PL/SQL. – The student will be able to:

70.01 Identify SQL statements that can be directly included in an executable block.
70.02 Construct and execute an INTO clause to hold values returned by a single-row SELECT statement.
70.03 Construct statements that retrieve data.

71.0 Manipulate data using PL/SQL. – The student will be able to:

71.01 Construct and execute PL/SQL statements that manipulate data with DML statements.
71.02 Describe when to use implicit or explicit cursors.
71.03 Create code to use SQL implicit cursor attributes to evaluate cursor activity.

72.0 Use transaction control statements. – The student will be able to:

72.01 Define a transaction and give an example.
72.02 Construct and execute a transaction control statement.

73.0 Use IF conditional control statements. – The student will be able to:

73.01 Construct and use an IF statement.
73.02 Construct and use an IF-THEN-ELSIF-ELSE statement.
73.03 Create PL/SQL to handle null conditions in an IF statement.

74.0 Use CASE conditional control statements. – The student will be able to:

74.01 Construct and use CASE statements.
74.02 Construct and use CASE expressions.
74.03 Include syntax to handle null conditions in a CASE statement.
74.04 Include syntax to handle Boolean conditions in IF and CASE statements.

75.0 Use basic LOOP iterative control statements. – The student will be able to:

75.01 Describe the types of LOOP statements and their uses.
75.02 Create PL/SQL containing a basic loop and an EXIT statement.
75.03 Create PL/SQL containing a basic loop and an EXIT statement with conditional termination.

76.0 Use WHILE and FOR loop iterative control statements. – The student will be able to:

76.01 Construct and use the WHILE looping construct.
76.02 Construct and use the FOR looping construct.
76.03 Describe when a WHILE loop is used.
76.04 Describe when a FOR loop is used.

77.0 Use nested loop iterative control statements. – The student will be able to:

77.01 Construct and execute PL/SQL using nested loops.
77.02 Evaluate a nested loop construct and identify the exit point.

78.0 Use explicit cursors. – The student will be able to:

78.01 List the guidelines for declaring and controlling explicit cursors.
78.02 Create PL/SQL code to open a cursor and fetch a piece of data into a variable.
78.03 Use a simple loop to fetch multiple rows from a cursor.
78.04 Create PL/SQL code to close a cursor.

79.0 Use explicit cursor attributes. – The student will be able to:

79.01 Define a record structure using the %ROWTYPE attribute.
79.02 Create PL/SQL code to process the row of an active set using record types in cursors.
79.03 Use cursor attributes to retrieve information about the state of an explicit cursor.

80.0 Use CURSOR FOR loops. – The student will be able to:

80.01 List and explain the benefits of using Cursor FOR loops.
80.02 Create PL/SQL code to declare a cursor and manipulate it in a FOR loop.
80.03 Create PL/SQL code containing a Cursor FOR loop using a subquery.

81.0 Use cursors with parameters. – The student will be able to:

81.01 List the benefits of using parameters with cursors.
81.02 Create PL/SQL code to declare and manipulate a cursor with a parameter.

82.0 Use cursors for UPDATE transactions. – The student will be able to:

82.01 Create PL/SQL code to lock rows before an update using the appropriate clause.
82.02 Explain the effect of using NOWAIT in an update cursor declaration.
82.03 Create PL/SQL code to use the current row of the cursor in an UPDATE or DELETE statement.

83.0 Use multiple cursors. – The student will be able to:

83.01 Explain the need for using multiple cursors to produce multilevel reports.
83.02 Create PL/SQL code to declare and manipulate multiple cursors within nested loops.
83.03 Create PL/SQL code to declare and manipulate multiple cursors using parameters.

84.0 Handle exceptions. – The student will be able to:

84.01 Describe the advantages of including exception handling code.
84.02 Describe the purpose of an EXCEPTION section in a PL/SQL block.
84.03 Create PL/SQL code to include an EXCEPTION section.
84.04 List the guidelines for exception handling.

85.0 Trap Oracle server exceptions. – The student will be able to:

85.01 Distinguish between errors defined by the Oracle Server and those defined by the programmer.
85.02 Differentiate between errors that are handled implicitly and explicitly by the Oracle Server.
85.03 Write PL/SQL code to trap a predefined Oracle Server error.
85.04 Write PL/SQL code to trap a non-predefined Oracle Server error.
85.05 Write PL/SQL code to identify an exception by error code and by error message.

86.0 Trap user-defined exceptions. – The student will be able to:

86.01 Write PL/SQL code to name a user-defined exception.
86.02 Write PL/SQL code to raise an exception.
86.03 Write PL/SQL code to handle a raised exception.
86.04 Write PL/SQL code to use RAISE_APPLICATION_ERROR.

87.0 Create procedures. – The student will be able to:

87.01 Differentiate between anonymous blocks and subprograms.
87.02 Identify the benefits of using subprograms.
87.03 Describe a stored procedure.
87.04 Create a procedure.
87.05 Describe how a stored procedure is invoked.

88.0 Use parameters in procedures. – The student will be able to:

88.01 Describe how parameters contribute to a procedure.
88.02 Define a parameter.
88.03 Create a procedure using a parameter.
88.04 Invoke a procedure that has parameters.
88.05 Distinguish between formal and actual parameters.

89.0 Pass parameters. – The student will be able to:

89.01 List the types of parameter modes.
89.02 Create a procedure that passes parameters.
89.03 Identify three methods for passing parameters.
89.04 Describe the DEFAULT option for parameters.

90.0 Create stored functions. – The student will be able to:

90.01 Describe the difference between a stored procedure and a stored function.
90.02 Create a PL/SQL block containing a function.
90.03 Identify ways in which functions may be invoked.
90.04 Create a PL/SQL block that invokes a function that has parameters.

91.0 Use functions in SQL statements. – The student will be able to:

91.01 Describe where user-defined functions can be called from within an SQL statement.
91.02 Describe the restrictions on calling functions from SQL statements.
91.03 Describe the purpose of the Data Dictionary.

91.04 Differentiate between the three types of Data Dictionary views.
91.05 Write SQL SELECT statements to retrieve information from the Data Dictionary.
91.06 Explain the use of DICTIONARY as a Data Dictionary search engine.

92.0 Manage procedures and functions. – The student will be able to:

92.01 Describe how exceptions are propagated.
92.02 Remove a function and a procedure.
92.03 Use Data Dictionary views to identify and manage stored procedures.

93.0 Manage object privileges. – The student will be able to:

93.01 List and explain several object privileges.
93.02 Explain the function of the EXECUTE object privilege.
93.03 Write SQL statements to grant and revoke object privileges.

94.0 Use invoker's rights. – The student will be able to:

94.01 Contrast invoker's rights with definer's rights.
94.02 Create a procedure that uses invoker's rights.

95.0 Create packages. – The student will be able to:

95.01 Describe a package, its components, and the reasons for use.
95.02 Create packages containing related variables, cursors, constants, exceptions, procedures, and functions.
95.03 Create a PL/SQL block that invokes a package construct.

96.0 Manage package constructs. – The student will be able to:

96.01 Explain the difference between public and private package constructs.
96.02 Designate a package construct as either public or private.
96.03 Specify the syntax to drop a package.
96.04 Identify Data Dictionary views used to manage packages.
96.05 Identify the guidelines for using packages.

97.0 Use advanced package concepts. – The student will be able to:

97.01 Write packages that use the overloading feature.
97.02 Write packages that use forward declarations.
97.03 Explain the purpose of a package initialization block.
97.04 Identify restrictions on using packaged functions in SQL statements.

98.0 Manage persistent state of package variables. – The student will be able to:

98.01 Identify persistent states of package variables.
98.02 Control the persistent state of a package cursor.

99.0 Use Oracle-supplied packages. – The student will be able to:

99.01 Describe two common uses for the DBMS_OUTPUT package.

99.02 Use the syntax to specify messages for the DBMS_OUTPUT package.
99.03 Describe the purpose for the UTL_FILE package.
99.04 Identify the exceptions used in conjunction with the UTL_FILE package.

100.0 Understand dynamic SQL. – The student will be able to:

100.01 Identify the stages through which all SQL statements pass.
100.02 Describe the reasons for using dynamic SQL to create an SQL statement.
100.03 List four PL/SQL statements supporting Native Dynamic SQL.
100.04 Describe the benefits of Execute Immediate over DBMS_SQL for Dynamic SQL.

101.0 Understand triggers. – The student will be able to:

101.01 Describe database triggers and their uses.
101.02 Differentiate between a database trigger and an application trigger.
101.03 List the guidelines for using triggers.
101.04 Compare and contrast database triggers and stored procedures.

102.0 Create DML triggers. – The student will be able to:

102.01 Create a DML trigger and identify its components.
102.02 Create a statement level trigger.
102.03 Describe the trigger firing sequence options.
102.04 Create a DML trigger that uses conditional predicates.
102.05 Create a row level trigger.
102.06 Create a row level trigger that uses OLD and NEW qualifiers.
102.07 Create an INSTEAD OF trigger.

103.0 Create DDL and database event triggers. – The student will be able to:

103.01 Describe the events that cause DDL and database event triggers to fire.
103.02 Create a trigger for a DDL statement.
103.03 Create a trigger for a database event.
103.04 Describe the functionality of the CALL statement.
103.05 Describe the cause of a mutating table.

104.0 Manage triggers. – The student will be able to:

104.01 View trigger information in the Data Dictionary.
104.02 Disable and enable a database trigger.
104.03 Remove a trigger from the database.

105.0 Use large object data types. – The student will be able to:

105.01 Compare and contrast LONG and LOB data types.
105.02 Describe LOB data types and how they are used.
105.03 Differentiate between internal and external LOBs.
105.04 Create and maintain LOB data types.
105.05 Migrate data from LONG to LOB.

106.0 Manage BFILEs. – The student will be able to:

106.01 Define BFILEs and the BFILE column data type.
106.02 Create directory objects and view them in the Data Dictionary.
106.03 Manage and manipulate BFILEs using BFILENAME and DBMS_LOB.

107.0 Manage indexes. – The student will be able to:

107.01 Create and manipulate user-defined PL/SQL records.
107.02 Create an INDEX BY table.
107.03 Create an INDEX BY table of records.
107.04 Describe the difference between records, tables, and tables of records.

108.0 Manage dependencies. – The student will be able to:

108.01 Describe the implications of procedural dependencies.
108.02 Contrast dependent objects and referenced objects.
108.03 View dependency information in the Data Dictionary.
108.04 Use the UTLDTREE script to create the objects required to display dependencies.
108.05 Use the IDEPTREE and DEPTREE views to display dependencies.
108.06 Describe when automatic recompilation occurs.
108.07 Describe how to minimize dependency failures.

128.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

128.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
128.02 Locate, organize and reference written information from various sources. CM 3.0
128.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
128.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
128.05 Apply active listening skills to obtain and clarify information. CM 7.0
128.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
128.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

129.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

129.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
129.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
129.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
129.04 Conduct technical research to gather information necessary for decision-making. PS 4.0

130.0 Use information technology tools. – The student will be able to:

130.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0

130.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
130.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
130.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

131.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

131.01 Describe the nature and types of business organizations. SY 1.0
131.02 Explain the effect of key organizational systems on performance and quality.
131.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
131.04 Explain the impact of the global economy on business organizations.

134.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

134.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
134.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
134.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
134.04 Interpret and explain written organizational policies and procedures. ELR 2.0

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Specialized Database Applications**
Course Number: **8206440**
Course Credit: **1**

Course Description:

This is the final course in the Database and Programming Essentials program and is designed to teach specialized database operations and utilization of SQL language for database administration and maintenance.

109.0 Program a database application. – The student will be able to:

- 109.01 Utilize loop statements.
- 109.02 Given a scenario, use arithmetic, comparison, and pattern-matching operators.
- 109.03 Create user-defined functions.
- 109.04 Utilize common built-in functions.
- 109.05 Declare variables in modules and procedures.
- 109.06 Declare arrays, and initialize elements of arrays.
- 109.07 Declare and use object variables and collections, and use their associated properties and methods.
- 109.08 Declare symbolic constants, and make them available locally or publicly.
- 109.09 Respond to events.

110.0 Utilize the basic concepts of database design. – The student will be able to:

- 110.01 Apply basic concepts of normalization.
- 110.02 Utilize the cascade update and cascade delete options.

111.0 Utilize SQL and UNION queries. – The student will be able to:

- 111.01 Utilize SQL to write common queries.
- 111.02 Refer to objects by using SQL.
- 111.03 Utilize union queries.

112.0 Implement program statements using objects. – The student will be able to:

- 112.01 Determine when to use data access objects.
- 112.02 Differentiate between objects and collections.
- 112.03 Write statements that access and modify database objects.
- 112.04 Utilize data access objects.
- 112.05 Select appropriate methods and property settings for use with specified objects.

113.0 Utilize debugging tools and write error handlers. – The student will be able to:

- 113.01 Trap errors.
- 113.02 Utilize debugging tools to suspend program execution, and to examine, step through, and reset execution of code.
- 113.03 Debug code samples.

113.04 Utilize the Debugger to monitor variable values.
113.05 Write an error handler.

114.0 Demonstrate file I/O. – The student will be able to:

114.01 Read from files.
114.02 Write to files.
114.03 Utilize record locking.

115.0 Create forms and identify all the properties of a form. – The student will be able to:

115.01 Choose form-specific and report-specific properties to set.
115.02 Choose control properties to set.
115.03 Assign event-handling procedures to controls in a form.
115.04 Define and create form and report modules.
115.05 Identify the scope of a form or report module.
115.06 Open multiple instances of a form, and refer to them.
115.07 Assign values to form properties.
115.08 Use form methods.

116.0 Manipulate data using object models – The student will be able to:

116.01 Connect to a data source.
116.02 Open a recordset.
116.03 Insert, update, delete and find data.

117.0 Develop custom controls. – The student will be able to:

117.01 Set properties for custom controls.
117.02 Customize user interface controls.

118.0 Utilize API functions. – The student will be able to:

118.01 Properly declare functions.
118.02 Use the by value and by reference parameters.

119.0 Demonstrate database replication and implement database replication using programming tools. – The student will be able to:

119.01 Make a database replicable.
119.02 View a synchronization schedule.
119.03 Explain the purpose of the Replication ID.
119.04 Explain how synchronization conflicts are resolved.
119.05 Identify the advantages of using replication of synchronization.
119.06 Identify the changes that the database engine makes when it converts a nonreplicable database into replicable database.

120.0 Analyze and implement security options. – The student will be able to:

120.01 Analyze a scenario, and recommend an appropriate type of security.
120.02 Explain the steps for implementing security.

120.03 Analyze code to ensure that it sets security options.
120.04 Write code to implement security options.

121.0 Implement client/server applications. – The student will be able to:

121.01 Demonstrate SQL pass through queries and application queries.
121.02 Access external data by using ODBC.
121.03 Trap errors that are generated by the server.
121.04 Optimize connections.
121.05 Optimize performance for a given client/server application.

122.0 Optimize the performance of a database. – The student will be able to:

122.01 Differentiate between single-field and multiple-field indexes.
122.02 Optimize queries.
122.03 Restructure queries to allow faster execution.
122.04 Optimize performance in distributed applications.
122.05 Optimize performance for client/server applications.

123.0 Perform application distribution. – The student will be able to:

123.01 Prepare an application for distribution.
123.02 Analyze various methods to distribute a client/server application.
123.03 Distribute custom controls with an application.
123.04 Provide online help.

124.0 Test and debug databases. – The student will be able to:

124.01 Implement error handling.
124.02 Test and debug library databases.

132.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

132.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
132.02 Explain emergency procedures to follow in response to workplace accidents.
132.03 Create a disaster and/or emergency response plan. SHE 2.0

133.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

133.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
133.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
133.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
133.04 Employ mentoring skills to inspire and teach others. LT 5.0

135.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

135.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
135.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
135.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
135.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
135.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
135.06 Identify and exhibit traits for retaining employment. ECD 7.0
135.07 Identify opportunities and research requirements for career advancement. ECD 8.0
135.08 Research the benefits of ongoing professional development. ECD 9.0
135.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

136.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

136.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
136.02 Describe the effect of money management on personal and career goals. FL 3.0
136.03 Develop a personal budget and financial goals. FL3.1
136.04 Complete financial instruments for making deposits and withdrawals. FL3.2
136.05 Maintain financial records. FL3.3
136.06 Read and reconcile financial statements. FL3.4
136.07 Research, compare and contrast investment opportunities.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Business Computer Programming**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	8206500	B070320
CIP Number	0507.030102	0507.030102
Grade Level	9-12, 30, 31	30, 31
Standard Length	8 credit hours	1200 hours
Teacher Certification	BUS ED 1 @2 VOE @7 TEACH CBE @7 BUS DP @7 G TEC ELEC $7 G ELECT DP @7 G BOOKKEEPIN @4 @7 G COMPU SCI 6	BUS ED 1 @2 VOE @7 TEACH CBE @7 BUS DP @7 G TEC ELEC $7 G ELECT DP @7 G BOOKKEEPIN @4 @7 G COMPU SCI 6
CTSO	FBLA BPA	Phi Beta Lambda BPA
SOC Codes (all applicable)	15-1041, 15-1021	15-1041, 15-1021
Facility Code	212 http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	Mathematics: 9.0 Language: 9.0 Reading: 9.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes,

general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster. This program offers a broad foundation of knowledge and skills to prepare students for employment in computer programming positions.

The content includes but is not limited to converting problems into detailed plans; writing code into computer language; testing, monitoring, debugging, documenting, and maintaining computer programs; and designing programs for specific uses and machines.

Program Structure

This program is a planned sequence of instruction consisting of the Business Technology Education Core and four additional occupational completion points. Secondary or postsecondary students who have previously completed the Business Technology Education Core will not have to repeat the core. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or exit as an occupational completer.

When offered at the post secondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	OTA0040	Information Technology Assistant	150	15-1041
B	CTS0041	Computer Programmer Assistant	300	15-1021
C	CTS0042	Junior Programmer	300	15-1021
D	CTS0043	Junior Programmer II	300	15-1021
E	CTS0044	Computer Programmer	150	15-1021

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8200320	Keyboarding and Business Skills	.5 credit	15-1041	2
		AND			
	8200330	Computer and Business Skills	.5 credit		2
		OR			
	8209020	Computing for College and Careers	1 credit		2
		OR			
	8207310	Introduction to Information Technology	1 credit		2

OCP	Course Number	Course Title	Length	SOC Code	Level
B	8206010 8206020	Business Computer Programming 1 Business Computer Programming 2	1 credit 1 credit	15-1021	2
C	8206030 8206040	Business Computer Programming 3 Business Computer Programming 4	1 credit 1 credit	15-1021	2
D	8206050 8206060	Business Computer Programming 5 Business Computer Programming 6	1 credit 1 credit	15-1021	3
E	8206070	Business Computer Programming 7	1 credit	15-1021	3

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills for secondary students. For postsecondary students, Phi Beta Lambda and BPA are the appropriate student organizations. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 9.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported

accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

The PSAV component of this program (B070320) has a statewide articulation agreement approved by the Articulation Coordinating Committee:

1. Computer Programming & Analysis AS/AAS (1507030500/0507030500) – 15 credits

For details on articulation agreements which correlate to programs and industry certifications refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

After successfully completing this program, the student will be able to perform the following:

Core Standards

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning though job shadowing, mentoring, e-coaching, etc.
08.0 Demonstrate personal and interpersonal skills appropriate for the workplace.

09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use Technology to apply and enhance communications skills in technical reading, writing.
04.0 Practice quality performance in the learning environment and the workplace.
05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
09.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
11.0 Perform e-mail activities.
12.0 Demonstrate operating systems.
13.0 Develop an awareness of emerging technologies.

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance and enhance personal performance in relation to the workplace. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal and professional ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and

enhance workplace performance.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.

10.0 Demonstrate personal and interpersonal skills and attributes appropriate for the workplace.

11.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.

12.0 Perform e-mail activities.

13.0 Demonstrate operating systems.

14.0 Develop an awareness of emerging technologies.

OR

Introduction to IT Competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.

02.0 Demonstrate Comprehension and communication skills.

03.0 Use technology to enhance the effectiveness of communication skills.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.

05.0 Practice quality performance in the learning environment and the workplace.

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.

11.0 Participate in work-based learning experiences.

12.0 Perform e-mail activities.

13.0 Demonstrate knowledge of different operating systems.

14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW.

15.0 Demonstrate proficiency using HTML commands.

16.0 Demonstrate proficiency in page design applicable to the WWW.

17.0 Demonstrate proficiency using specialized web design software.

18.0 Develop an awareness of the information technology industry.

19.0 Develop an awareness of microprocessors and digital computers.

20.0 Develop an awareness of programming languages.

21.0 Develop an awareness of emerging technologies.

22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model.

23.0 Demonstrate proficiency using common software applications.
24.0 Demonstrate proficiency using specialized software applications.

Program Standards

25.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal develop, and life goals.
26.0 Participate in work-based learning experiences.
27.0 Identify functions of information processing.
28.0 Identify functions of computers.
29.0 Test programs.
30.0 Plan program design.
31.0 Code programs.
32.0 Perform program maintenance.
33.0 Create and maintain documentation.
34.0 Evaluate assigned business computer programming tasks.
35.0 Develop an understanding of basic financial business concepts.
36.0 Understand the integrated nature of corporate systems.
37.0 Demonstrate an understanding of operating systems, environments, and platforms.
38.0 Develop an awareness of software quality assurance.
39.0 Implement enhanced program structures.
40.0 Develop an understanding of programming techniques and concepts.

41.0 Demonstrate language arts knowledge and skills.
42.0 Demonstrate mathematics knowledge and skills.
43.0 Demonstrate science knowledge and skills.
44.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
45.0 Solve problems using critical thinking skills, creativity and innovation.
46.0 Use information technology tools.
47.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
48.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
49.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
50.0 Describe the importance of professional ethics and legal responsibilities.
51.0 Explain the importance of employability skill and entrepreneurship skills.
52.0 Demonstrate personal money-management concepts, procedures, and strategies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Business Computer Programming**
PSAV Number: **B070320**

Course Number: OTA0040
Occupational Completion Point: A
Information Technology Assistant – 150 Hours – SOC Code 15-1041

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Demonstrate basic file management skills.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 03.01 Select and use word processing software and accompanying features to enhance written business communications.
- 03.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.
- 03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

07.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
07.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
07.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
07.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

08.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

08.01 Accept constructive criticism.
08.02 Apply appropriate strategies to manage and resolve conflict in work situations.
08.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

09.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
09.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic file management skills.
01.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

02.01 Take notes, organize, summarize, and paraphrase ideas and details.
02.02 Accurately follow written and oral instructions.
02.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
03.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

04.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
04.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

05.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
05.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
05.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
06.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
06.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

07.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
07.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

07.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

08.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
08.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
08.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
08.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
08.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
08.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
08.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
08.08 Build mentor relationships with local professionals in the industry.

09.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

09.01 Accept constructive criticism.
09.02 Apply appropriate strategies to manage and resolve conflict in work situations.
09.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

10.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

11.0 Perform e-mail activities. – The student will be able to:

11.01 Describe e-mail capabilities and functions.
11.02 Use the Internet to perform e-mail activities.

12.0 Demonstrate operating systems. – The student will be able to:

12.01 Identify operating system file naming conventions.

12.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
12.03 Demonstrate a working knowledge of standard file formats.
12.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

13.0 Develop an awareness of emerging technologies. – The student will be able to:

13.01 Compare and contrast various methods of evaluation for emerging technologies.
13.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
13.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Computing for College and Careers Standards:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. – The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic computer file management skills.
01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
02.02 Write clear and well-organized research papers, integrating a variety of information.
02.03 Prepare and deliver an oral report with appropriate materials to the class
02.04 Participate in large group discussions as a member and/or a leader.
02.05 Take notes, organize, summarize, and paraphrase ideas and details.
02.06 Accurately follow written and oral instructions.
02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills. – The student will be able to:

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance. – The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace. – The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies. – The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Introduction to Information Technology Standards:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. – The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Use professional business vocabulary appropriate for information technology environments.
- 02.03 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.04 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.05 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.06 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.07 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills. – The student will be able to:

- 03.01 Use database, spreadsheet, and presentation software, scheduling, and integrated software packages to enhance communication.
- 03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles. – The student will be able to:

- 04.01 Explore, design, implement, and evaluate organizational structures and cultures.
- 04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
- 04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

- 05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
- 05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance. – The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace. – The student will be able to:

10.01 Accept constructive criticism.
10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences. – The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities. – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.
12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.
12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems. – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW. – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.

14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, pdf, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using HTML commands. – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the WWW. – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software. – The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry. – The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.

18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers. – The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages. – The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies. – The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the open systems interface (OSI) model. – The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software

23.0 Demonstrate proficiency using common software applications. – The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail,

presentation, database, scheduling, financial management, Java applet, music, etc.).

23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications. – The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).

24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)

24.03 Demonstrate the ability to incorporate digital sound.

Course Number: CTS0041
Occupational Completion Point: B
Computer Programmer Assistant – 300 Hours – SOC Code 15-1021

25.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

25.01 Investigate specific job opportunities in single language computer programming in the local job market.

25.02 Identify tasks performed by computer programming personnel.

25.03 Identify alternative career paths for computer programmers.

25.04 Investigate the need for additional training for computer programmers.

26.0 Participate in work-based learning experiences. – The student will be able to:

26.01 Participate in work-based learning experiences in a computer programming environment.

26.02 Discuss the use of technology in a computer programming environment.

26.03 Compare and contrast programming languages used in a computer programming environment.

27.0 Identify functions of information processing. – The student will be able to:

27.01 Identify characteristics of high-level languages.

27.02 Identify characteristics of operating systems.

27.03 Identify characteristics of sequential, indexed-sequential, random, and direct files.

27.04 Identify characteristics of a network.

27.05 Identify needs for software development in business.

27.06 Identify causes of software development problems in business.

27.07 Identify most appropriate languages for solving business problems.

27.08 Describe the difference between a database management system and a file

management system.
27.09 Manipulate data between numbering systems.
27.10 Identify how numeric and non-numeric data are represented in memory.
27.11 Distinguish among integer, fixed-point, and floating-point calculations.

28.0 Identify functions of computers. – The student will be able to:

28.01 Identify computer hardware and software.
28.02 Identify generic data processing terminology.
28.03 Identify advanced data processing terminology.
28.04 Sequence and define the steps in the input, processing, output, and storage cycle.
28.05 Identify examples of emerging hardware technology.
28.06 Illustrate various configurations of hardware components.

29.0 Test programs. – The student will be able to:

29.01 Develop a plan for testing programs.
29.02 Develop data for use in program testing.
29.03 Perform debugging activities.
29.04 Distinguish among the different types of program and design errors.
29.05 Evaluate program test results.
29.06 Execute programs and subroutines as they relate to the total application.
29.07 Use trace routines of compilers to assist in program debugging.
29.08 Compile and run programs.

30.0 Plan program design. – The student will be able to:

30.01 Formulate a plan to determine program specifications individually or in groups.
30.02 Use a graphical representation or pseudo code to represent the structure in a program or subroutine.
30.03 Design programs to solve problems using problem-solving strategies.
30.04 Prepare proper input/output layout specifications.
30.05 Examine existing utility programs and subroutines for use with other programs.
30.06 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.

31.0 Code programs. – The student will be able to:

31.01 Utilize reference manuals.
31.02 Write programs according to recognized programming standards.
31.03 Write internal documentation statements as needed in the program source code.
31.04 Code programs in high-level languages for business applications.
31.05 Write code that accesses sequential, indexed sequential, random, and direct files.
31.06 Code programs using logical statements (e.g., If-Then-Else, Do...While).
31.07 Enter and modify source code using a program language editor.
31.08 Code routines within programs that validate input data.
31.09 Use the rounding function in calculations within programs.

32.0 Perform program maintenance. – The student will be able to:

32.01 Review requested modification of programs and establish a plan of action.
32.02 Design needed modifications in conformance with established standards.
32.03 Code, test, and debug modifications prior to updating production code.
32.04 Update production programs and documentation with changes.
32.05 Analyze output to identify and annotate errors or enhancements.

33.0 Create and maintain documentation. – The student will be able to:

33.01 Write documentation to assist operators and end-users.
33.02 Follow established documentation standards.
33.03 Update existing documentation to reflect program changes.

34.0 Evaluate assigned business computer programming tasks. – The student will be able to:

34.01 Estimate the time necessary to write a program.

35.0 Develop an understanding of basic financial business concepts. – The student will be able to:

35.01 Identify generic accounting terminology as it relates to information systems.
35.02 Identify ways in which transactions interact with various business systems.

36.0 Understand the integrated nature of corporate systems. – The student will be able to:

36.01 Analyze the flow of information throughout the various departments in a business.
36.02 Explain how programs written for one department affect other departments in the business.

37.0 Demonstrate an understanding of operating systems, environments, and platforms. – The student will be able to:

37.01 Identify various types of operating systems/environments for different computer hardware platforms.
37.02 Assess and analyze the functions of different operating systems.
37.03 Distinguish between different types of computer hardware platforms.

38.0 Develop an awareness of software quality assurance. – The student will be able to:

38.01 Identify the legal and social consequences of errors in software.
38.02 Describe copyright and other laws that relate to software theft and misuse.
38.03 Describe software security measures to protect computer systems and data from unauthorized use and tampering (e.g., physical security, passwords, virus protection/prevention).

39.0 Implement enhanced program structures. – The student will be able to:

39.01 Write programs that incorporate multi-level subtotals and page breaks.
39.02 Write programs that include tables or arrays and routines for data entry and lookup.

39.03 Write routines to sort arrays.
39.04 Write programs that sort records in files.
39.05 Write programs to create and maintain a master file.
39.06 Write programs to process transactions.
39.07 Write programs that use iteration.
39.08 Write programs that read and write sequential files.
39.09 Write programs that read and write indexed-sequential files.
39.10 Write programs that read and write random files.

40.0 Develop an understanding of programming techniques and concepts. – The student will be able to:

40.01 Identify the basic constructs used in structured programming.
40.02 Distinguish between top-down and bottom-up design.
40.03 Distinguish between iteration and recursion.
40.04 Evaluate Boolean expressions.
40.05 Distinguish between interpreters and compilers.

41.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

41.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
41.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
41.03 Present information formally and informally for specific purposes and audiences. AF2.9

42.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

42.01 Demonstrate knowledge of arithmetic operations. AF3.2
42.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
42.03 Construct charts/tables/graphs using functions and data. AF3.5

43.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

43.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
43.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

44.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

44.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
44.02 Locate, organize and reference written information from various sources. CM 3.0
44.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
44.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
44.05 Apply active listening skills to obtain and clarify information. CM 7.0
44.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0

44.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

45.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

45.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
45.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
45.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
45.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

46.0 Use information technology tools. – The student will be able to:

46.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
46.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
46.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
46.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

47.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

47.01 Describe the nature and types of business organizations. SY 1.0
47.02 Explain the effect of key organizational systems on performance and quality.
47.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
47.04 Explain the impact of the global economy on business organizations.

50.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

50.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
50.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
50.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
50.04 Interpret and explain written organizational policies and procedures. ELR 2.0

Course Number: CTS0042
Occupational Completion Point: C
Junior Programmer – 300 Hours – SOC Code 15-1021

26.0 Participate in work-based learning experiences. – The student will be able to:

26.01 Participate in work-based learning experiences in a computer programming

environment.

26.02 Compare and contrast programming languages used in a computer programming environment.

26.03 Discuss the management/supervisory skills needed in a computer programming environment.

27.0 Identify functions of information processing. – The student will be able to:

27.01 Identify the advantages and disadvantages of blocking and buffering when accessing data on tape and disk storage.

27.02 Choose appropriate storage of numeric values to insure precision needed for calculations (e.g., integer, fixed-point, floating-point).

28.0 Identify functions of computers. – The student will be able to:

28.01 Identify the advantages and disadvantages of virtual memory.

29.0 Test programs. – The student will be able to:

29.01 Develop a plan for system integration testing.

30.0 Plan program design. – The student will be able to:

30.01 Plan interfaces for systems integration.

31.0 Code programs. – The student will be able to:

31.01 Access external files in a client/server environment.

32.0 Perform program maintenance. – The student will be able to:

32.01 Modify or create new programs for vendor supplied applications.

32.02 Use a computer system with current commercial-end application software to solve problems within an organizational environment.

34.0 Evaluate assigned business computer programming tasks. – The student will be able to:

34.01 Utilize and apply project and time management tools to control systems development.

34.02 Analyze computer resources necessary to run a program.

38.0 Develop an awareness of software quality assurance. – The student will be able to:

38.01 Evaluate performance, functionality, and validity of various software packages.

39.0 Implement enhanced program structures. – The student will be able to:

39.01 Write programs to import/export data from external sources.

39.02 Write routines that incorporate “help” text.

39.03 Write interactive programs.

39.04 Design screen layouts for use in interactive programs.

40.0 Develop an understanding of programming techniques and concepts. – The student will be able to:

40.01 Identify object-oriented concepts and provide examples of objects in an object-oriented language.
40.02 Describe development methodologies, programming and system languages, database technologies, and data communication.

48.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

48.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
48.02 Explain emergency procedures to follow in response to workplace accidents.
48.03 Create a disaster and/or emergency response plan. SHE 2.0

49.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

49.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
49.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
49.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
49.04 Employ mentoring skills to inspire and teach others. LT 5.0

51.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

51.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
51.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
51.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
51.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
51.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
51.06 Identify and exhibit traits for retaining employment. ECD 7.0
51.07 Identify opportunities and research requirements for career advancement. ECD 8.0
51.08 Research the benefits of ongoing professional development. ECD 9.0
51.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

52.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

52.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
52.02 Describe the effect of money management on personal and career goals. FL 3.0
52.03 Develop a personal budget and financial goals. FL3.1
52.04 Complete financial instruments for making deposits and withdrawals. FL3.2
52.05 Maintain financial records. FL3.3
52.06 Read and reconcile financial statements. FL3.4

52.07 Research, compare and contrast investment opportunities.

Course Number: CTS0043
Occupational Completion Point – D
Junior Programmer II – 300 Hours – SOC Code 15-1021

29.0 Test programs. – The student will be able to:

29.01 Develop a plan for testing programs.
29.02 Develop a plan for system integration testing.
29.03 Develop data for use in program testing.
29.04 Perform debugging activities.
29.05 Distinguish among the different types of program and design errors.
29.06 Evaluate program test results.
29.07 Execute programs and subroutines as they relate to the total application.
29.08 Use trace routines of compilers to assist in program debugging.
29.09 Compile and run programs.

30.0 Plan program design. – The student will be able to:

30.01 Formulate a plan to determine program specifications individually or in groups.
30.02 Use a graphical representation or pseudo code to represent the structure in a program or subroutine.
30.03 Design programs to solve problems using problem-solving strategies.
30.04 Prepare proper input/output layout specifications.
30.05 Examine existing utility programs and subroutines for use with other programs.
30.06 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.

31.0 Code programs. – The student will be able to:

31.01 Utilize reference manuals.
31.02 Write programs according to recognized programming standards.
31.03 Write internal documentation statements as needed in the program source code.
31.04 Code programs in high-level languages for business applications.
31.05 Write code that accesses sequential, indexed sequential, random, and direct files.
31.06 Code programs using logical statements (e.g., If-Then-Else, Do...While).
31.07 Enter and modify source code using a program language editor.
31.08 Code routines within programs that validate input data.
31.09 Use the rounding function in calculations within programs.

32.0 Perform program maintenance. – The student will be able to:

32.01 Review requested modification of programs and establish a plan of action.
32.02 Design needed modifications in conformance with established standards.
32.03 Code, test, and debug modifications prior to updating production code.
32.04 Update production programs and documentation with changes.
32.05 Analyze output to identify and annotate errors or enhancements.
32.06 Modify or create new programs for vendor supplied applications.

32.07 Use a computer system with current commercial-end application software to solve problems within an organizational environment.

33.0 Create and maintain documentation. – The student will be able to:

33.01 Write documentation to assist operators and end-users.
33.02 Follow established documentation standards.
33.03 Update existing documentation to reflect program changes.

34.0 Evaluate assigned business computer programming tasks. – The student will be able to:

34.01 Utilize and apply project and time management tools to control systems development.
34.02 Analyze computer resources necessary to run a program.

37.0 Demonstrate an understanding of operating systems, environments, and platforms. – The student will be able to:

37.01 Assess and analyze the functions of different operating systems.
37.02 Assess and analyze the program development and execution utilities of relevant operating systems.

38.0 Develop an awareness of software quality assurance. – The student will be able to:

38.01 Evaluate performance, functionality, and validity of various software packages.

39.0 Implement enhanced program structures. – The student will be able to:

39.01 Write programs that incorporate multi-level subtotals and page breaks.
39.02 Write programs that include tables or arrays and routines for data entry and lookup.
39.03 Write routines to sort arrays.
39.04 Write programs that sort records in files.
39.05 Write programs to create and maintain a master file.
39.06 Write programs to process transactions.
39.07 Write programs to import/export/convert data from external sources.
39.08 Write programs that use iteration.
39.09 Write routines that incorporate “help” text.
39.10 Write programs that read and write sequential files.
39.11 Write programs that read and write indexed-sequential files.
39.12 Write programs that read and write random files.
39.13 Write interactive programs.
39.14 Design screen layouts for use in interactive programs.
39.15 Write programs using object-oriented languages.

40.0 Develop an understanding of programming techniques and concepts. – The student will be able to:

40.01 Describe development methodologies, programming and system languages, database technologies, and data communication.

Course Number: CTS0044
Occupational Completion Point – E
Computer Programmer – 150 Hours – SOC Code 15-1021

29.0 Test programs. – The student will be able to:

- 29.01 Develop a plan for testing programs.
- 29.02 Develop a plan for system integration testing.
- 29.03 Develop data for use in program testing.
- 29.04 Perform debugging activities.
- 29.05 Distinguish among the different types of program and design errors.
- 29.06 Evaluate program test results.
- 29.07 Execute programs and subroutines as they relate to the total application.
- 29.08 Use trace routines of compilers to assist in program debugging.
- 29.09 Compile and run programs.

30.0 Plan program design. – The student will be able to:

- 30.01 Formulate a plan to determine program specifications individually or in groups.
- 30.02 Use a graphical representation or pseudo code to represent the structure in a program or subroutine.
- 30.03 Design programs to solve problems using problem-solving strategies.
- 30.04 Prepare proper input/output layout specifications.
- 30.05 Examine existing utility programs and subroutines for use with other programs.
- 30.06 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.

31.0 Code programs. – The student will be able to:

- 31.01 Utilize reference manuals.
- 31.02 Write programs according to recognized programming standards.
- 31.03 Write internal documentation statements as needed in the program source code.
- 31.04 Code programs in high-level languages for business applications.
- 31.05 Write code that accesses sequential, indexed sequential, random, and direct files.
- 31.06 Code programs using logical statements (e.g., If-Then-Else, Do-While).
- 31.07 Enter and modify source code using a program language editor.
- 31.08 Code routines within programs that validate input data.
- 31.09 Use the rounding function in calculations within programs.

32.0 Perform program maintenance. – The student will be able to:

- 32.01 Review requested modification of programs and establish a plan of action.
- 32.02 Design needed modifications in conformance with established standards.
- 32.03 Code, test, and debug modifications prior to updating production code.
- 32.04 Update production programs and documentation with changes.
- 32.05 Analyze output to identify and annotate errors or enhancements.

39.0 Implement enhanced program structures. – The student will be able to:

39.01 Write programs that include tables or arrays and routines for data entry and lookup.
39.02 Write programs that use iteration.
39.03 Write routines that incorporate “help” text.
39.04 Write programs that read and write sequential files.
39.05 Write programs that read and write indexed-sequential files.
39.06 Write programs that read and write random files.
39.07 Write interactive programs.
39.08 Design screen layouts for use in interactive programs.
39.09 Write programs using object-oriented languages.
39.10 Write programs that include data structures (e.g., stacks, queues, trees, linked lists).
39.11 Write programs that are event-driven.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Keyboarding and Business Skills**
Course Number: **8200320**
Course Credit: **.5**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental word processing applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society.

This course, along with Computer and Business Skills is equivalent to Computing for College and Careers. Students should complete this course before enrolling in Computer and Business Skills.

10.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 10.01 Develop keyboarding skills to enter and manipulate text and data.
- 10.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 10.03 Demonstrate basic file management skills.

11.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 11.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 11.02 Write clear and well-organized research papers, integrating a variety of information.
- 11.03 Prepare and deliver an oral report with appropriate materials to the class
- 11.04 Participate in large group discussions as a member and/or a leader.
- 11.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 11.06 Accurately follow written and oral instructions.
- 11.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

12.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 12.01 Select and use word processing software and accompanying features to enhance written business communications.
- 12.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.

12.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

13.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

13.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
13.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
13.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

14.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

14.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
14.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

15.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

15.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
15.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
15.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

16.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

16.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
16.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.

16.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
16.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

17.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

17.01 Accept constructive criticism.
17.02 Apply appropriate strategies to manage and resolve conflict in work situations.
17.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

18.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
18.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer and Business Skills**
Course Number: **8200330**
Course Credit: **.5**

Course Description:

This course is designed to introduce students to the basic skills and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

This course, along with Keyboarding and Business Skills is equivalent to Computing for College and Careers. Students should complete Keyboarding and Business Skills before enrolling in this course.

14.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 14.01 Develop keyboarding skills to enter and manipulate text and data.
- 14.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 14.03 Identify and describe communications and networking systems used in workplace environments.
- 14.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 14.05 Demonstrate basic file management skills.
- 14.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
- 14.07 Describe ethical issues and problems associated with computers and information systems.
- 14.08 Apply ergonomic principles applicable to the configuration of computer workstations.

15.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

- 15.01 Take notes, organize, summarize, and paraphrase ideas and details.
- 15.02 Accurately follow written and oral instructions.
- 15.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

16.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

16.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
16.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
16.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

17.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

17.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
17.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

18.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
18.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
18.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

19.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

19.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
19.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
19.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

20.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

20.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
20.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

20.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

21.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

21.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
21.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
21.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
21.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
21.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
21.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
21.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
21.08 Build mentor relationships with local professionals in the industry.

22.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

22.01 Accept constructive criticism.
22.02 Apply appropriate strategies to manage and resolve conflict in work situations.
22.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

23.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

23.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

24.0 Perform e-mail activities. – The student will be able to:

24.01 Describe e-mail capabilities and functions.
24.02 Use the Internet to perform e-mail activities.

25.0 Demonstrate operating systems. – The student will be able to:

25.01 Identify operating system file naming conventions.

25.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
25.03 Demonstrate a working knowledge of standard file formats.
25.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

26.0 Develop an awareness of emerging technologies. – The student will be able to:

26.01 Compare and contrast various methods of evaluation for emerging technologies.
26.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
26.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computing for College and Careers**
Course Number: **8209020**
Course Credit: **1**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society. This also includes proficiency with computers using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

Information Systems

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Demonstrate basic computer file management skills.
- 01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.07 Describe ethical issues and problems associated with computers and information systems.
- 01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

Workplace Communications

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.

02.06 Accurately follow written and oral instructions.
02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills. – The student will be able to:

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

Management

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.

06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

Mathematics and Finance

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance. – The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

Job Readiness and Career Development

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up).
09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.

09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
09.08 Build mentor relationships with local professionals in the industry.

Human Relations/Interpersonal Skills

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace. – The student will be able to:

10.01 Accept constructive criticism.
10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.
10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

Administrative Procedures

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

Network/Software Support

12.0 Perform e-mail activities–The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems–The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

Information Technology

14.0 Develop an awareness of emerging technologies. – The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

Florida Department of Education
Student Performance Standards

Course Title: **Introduction to Information Technology**
Course Number: **8207310**
Course Credit: **1**

Course Description:

This course is designed to provide an introduction to information technology concepts and careers as well as the impact information technology has on the world, people, and industry and basic web design concepts. The content includes information technology career research; operating systems and software applications; electronic communications including e-mail and Internet services; basic HTML, DHTML, and XML web commands and design; and emerging technologies and web page design.

Information Systems

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.06 Describe ethical issues and problems associated with computers and information systems.

Workplace Communications

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

Management

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

Mathematics and Finance

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance. – The student will be able to:
07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.

07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

Job Readiness and Career Development

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace. – The student will be able to:

10.01 Accept constructive criticism.
10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

Work-Based Learning

11.0 Participate in work-based learning experiences. – The student will be able to:
11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

Network/Software Support

12.0 Perform e-mail activities – The student will be able to:

- 12.01 Describe e-mail capabilities and functions.
- 12.02 Identify components of an e-mail message.
- 12.03 Identify the components of an e-mail address.
- 12.04 Identify when to use different e-mail options.
- 12.05 Attach a file to an e-mail message.
- 12.06 Forward an e-mail message.
- 12.07 Use an address book.
- 12.08 Reply to an e-mail message.
- 12.09 Use the Internet to perform e-mail activities.
- 12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
- 12.11 Identify when to include information from an original e-mail message in a response.
- 12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems – The student will be able to:

- 13.01 Identify operating system file naming conventions.
- 13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
- 13.03 Demonstrate a working knowledge of standard file formats.
- 13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

Web Design

14.0 Demonstrate proficiency navigating the internet, intranet, and the www – The student will be able to:

- 14.01 Identify and describe Web terminology.
- 14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
- 14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
- 14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
- 14.05 Trace the evolution of the Internet from its inception to the present and into the future.
- 14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
- 14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, pdf, etc.).
- 14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using html commands – The student will be able to:

- 15.01 Identify elements of a Web page.

15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the www – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software - The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

Information Technology

18.0 Develop an awareness of the information technology industry - The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers - The student will be able to:
19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.

19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages - The student will be able to:
20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies - The student will be able to:
21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the open systems interface (osi) model - The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

Software Applications

23.0 Demonstrate proficiency using common software applications - The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications - The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Business Computer Programming 1**
Course Number: **8206010**
Course Credit: **1**

Course Description:

This course introduces computer programming concepts for business applications. The content includes basic information processing and computer functions; operating systems, environments, and hardware platforms; programming techniques and concepts; and basic financial business concepts. After successful completion of Business Computer Programming 1 and 2, students will have met Occupational Completion Point B, Computer Programmer Assistant, SOC Code 15.1021.

Job Readiness and Career Development

25.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

- 25.01 Investigate specific job opportunities in computer programming in the local job market.
- 25.02 Identify tasks performed by computer programming personnel.
- 25.03 Identify alternative career paths for computer programmers.
- 25.04 Investigate the need for additional training for computer programmers.

Work-Based Learning

26.0 Participate in work-based learning experiences. – The student will be able to:

- 26.01 Participate in work-based learning experiences in a computer programming environment.
- 26.02 Discuss the use of technology in a computer programming environment.

Business Computer Programming

27.0 Identify functions of information processing. – The student will be able to:

- 27.01 Identify characteristics of high-level languages.
- 27.02 Identify characteristics of operating systems.
- 27.03 Identify characteristics of sequential, indexed-sequential, random, and direct files.
- 27.04 Identify characteristics of a network.
- 27.05 Identify needs for software development in business.
- 27.06 Distinguish among integer, fixed-point, and floating-point calculations.

28.0 Identify functions of computers. – The student will be able to:

- 28.01 Identify computer hardware and software.

28.02 Identify generic data processing terminology.
28.03 Sequence and define the steps in the input, processing, output, and storage cycle.

29.0 Test programs. – The student will be able to:

29.01 Develop a plan for testing programs.
29.02 Develop data for use in program testing.
29.03 Perform debugging activities.
29.04 Distinguish among the different types of program and design errors.
29.05 Evaluate program test results.
29.06 Execute programs and subroutines as they relate to the total application.
29.07 Compile and run programs.

30.0 Plan program design. – The student will be able to:

30.01 Formulate a plan to determine program specifications individually and in groups.
30.02 Use a graphical representation or pseudocode to represent the structure in a program or subroutine.
30.03 Design programs to solve problems using problem-solving strategies.
30.04 Prepare proper input/output layout specifications.
30.05 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.

31.0 Code programs. – The student will be able to:

31.01 Utilize reference manuals.
31.02 Write programs according to the recognized programming standards.
31.03 Write internal documentation statements as needed in the program source code.
31.04 Code programs in high-level languages for business applications.
31.05 Code programs using logical statement (e.g., If-Then-Else, Do...While).
31.06 Enter and modify source code using a program language editor.
31.07 Code routines within programs that validate input data.
31.08 Use the rounding function in calculations within programs.

32.0 Perform program maintenance. – The student will be able to:

32.01 Analyze output to identify and annotate errors or enhancements.

33.0 Create and maintain documentation. – The student will be able to:

33.01 Follow established documentation standards.

35.0 Develop an understanding of basic financial business concepts. – The student will be able to:

35.01 Identify generic accounting terminology as it relates to information systems.
35.02 Identify ways in which transactions interact with various business systems.

37.0 Demonstrate an understanding of operating systems, environments, and platforms. – The student will be able to:

37.01 Identify various types of operating systems/environments for different computer hardware platforms.
37.02 Distinguish between different types of computer hardware platforms.

38.0 Develop an awareness of software quality assurance. – The student will be able to:

38.01 Identify the legal and social consequences of errors in software.
38.02 Describe copyright and other laws that relate to software theft and misuse.
38.03 Describe software security measures to protect computer systems and data from unauthorized use and tampering (e.g., physical security, passwords, virus protection/prevention).

39.0 Implement enhanced program structures. – The student will be able to:

39.01 Write programs that incorporate multi-level subtotals and page breaks.
39.02 Write programs that include tables or arrays or routines for data entry and lookup.
39.03 Write programs that use iteration.

40.0 Develop an understanding of programming techniques and concepts. – The student will be able to:

40.01 Identify the basic constructs used in structured programming.
40.02 Distinguish between top-down and bottom-up design.
40.03 Distinguish between interpreters and compilers.

41.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

41.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
41.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
41.03 Present information formally and informally for specific purposes and audiences. AF2.9

42.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

42.01 Demonstrate knowledge of arithmetic operations. AF3.2
42.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
42.03 Construct charts/tables/graphs using functions and data. AF3.5

43.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

43.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
43.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Business Computer Programming 2**
Course Number: **8206020**
Course Credit: **1**

Course Description:

This course continues the study of computer programming concepts for business applications. The content includes information processing and computer functions; operating systems; programming techniques and concepts for sequential, indexed sequential, random, and direct files; and the integrated nature of corporate systems. After successful completion of Business Computer Programming 1 and 2, students will have met Occupational Completion Point B, Computer Programmer Assistant, SOC Code 15.1021.

Work-Based Learning

25.0 Participate in work-based learning experiences. – The student will be able to:

- 25.01 Participate in work-based learning experiences in a computer programming environment.
- 25.02 Discuss the use of technology in a computer programming environment.
- 25.03 Compare and contrast programming languages used in a computer programming environment.

Business Computer Programming

27.0 Identify functions of information processing. – The student will be able to:

- 27.01 Identify causes of software development problems in business.
- 27.02 Identify most appropriate languages for solving business problems.
- 27.03 Describe the difference between a database management system and a file management system.
- 27.04 Manipulate data between numbering systems.
- 27.05 Identify how numeric and non-numeric data are represented in memory.

28.0 Identify functions of computers. – The student will be able to:

- 28.01 Identify advanced data processing terminology.
- 28.02 Identify examples of emerging hardware technology.
- 28.03 Illustrate various configurations of hardware components.

29.0 Test programs. – The student will be able to:

- 29.01 Use trace routines of compilers to assist in program debugging.

30.0 Plan program design. – The student will be able to:

- 30.01 Examine existing utility programs and subroutines for use with other programs.

31.0 Code programs. – The student will be able to:

31.01 Write code that accesses sequential, indexed sequential, random, and direct files.

32.0 Perform program maintenance. – The student will be able to:

32.01 Review requested modification of programs and establish a plan of action.
32.02 Design needed modifications in conformance with established standards.
32.03 Code, test, and debug modifications prior to updating production code.
32.04 Update production programs and documentation with changes.

33.0 Create and maintain documentation. – The student will be able to:

33.01 Write documentation to assist operators and end-users.
33.02 Update existing documentation to reflect program changes.

34.0 Evaluate assigned business computer programming tasks. – The student will be able to:

34.01 Estimate the time necessary to write a program.

36.0 Understand the integrated nature of corporate systems. – The student will be able to:

36.01 Analyze the flow of information throughout the various departments in a business.
36.02 Explain how programs written for one department affect other departments in the business.

37.0 Demonstrate an understanding of operating systems, environments, and platforms. – The student will be able to:

37.01 Assess and analyze the functions of different operating systems.

39.0 Implement enhanced program structures. – The student will be able to:

39.01 Write routines to sort arrays.
39.02 Write programs that sort records in files.
39.03 Write programs to create and maintain a master file.
39.04 Write programs to process transactions.
39.05 Write programs that read and write sequential files.
39.06 Write programs that read and write indexed-sequential files.
39.07 Write programs that read and write random files.

40.0 Develop an understanding of programming techniques and concepts. – The student will be able to:

40.01 Distinguish between iteration and recursion.
40.02 Evaluate Boolean expressions.

44.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

- 44.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
- 44.02 Locate, organize and reference written information from various sources. CM 3.0
- 44.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
- 44.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
- 44.05 Apply active listening skills to obtain and clarify information. CM 7.0
- 44.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
- 44.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

45.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

- 45.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
- 45.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
- 45.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
- 45.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

46.0 Use information technology tools. – The student will be able to:

- 46.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
- 46.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
- 46.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
- 46.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

47.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

- 47.01 Describe the nature and types of business organizations. SY 1.0
- 47.02 Explain the effect of key organizational systems on performance and quality.
- 47.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
- 47.04 Explain the impact of the global economy on business organizations.

50.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

- 50.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
- 50.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1

50.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2

50.04 Interpret and explain written organizational policies and procedures. ELR 2.0

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Business Computer Programming 3**
Course Number: **8206030**
Course Credit: **1**

Course Description:

This course continues the study of computer programming concepts for business applications. The content includes interfaces for systems integration, software quality assurance, and advanced programming techniques and concepts. After successful completion of Business Computer Programming 3 and 4, students will have met Occupational Completion Point C, Junior Programmer, SOC Code 15.1021.

Work-Based Learning

25.0 Participate in work-based learning experiences. – The student will be able to:

- 25.01 Participate in work-based learning experiences in a computer programming environment.
- 25.02 Compare and contrast programming languages used in a computer programming environment.

Business Computer Programming

27.0 Identify functions of information processing. – The student will be able to:

- 27.01 Choose appropriate storage of numeric values to insure precision needed for calculations (e.g., integer, fixed-point, floating-point).

28.0 Identify functions of computers. – The student will be able to:

- 28.01 Identify the advantages and disadvantages of virtual memory.

29.0 Test programs. – The student will be able to:

- 29.01 Develop a plan for system integration testing.

30.0 Plan program design. – The student will be able to:

- 30.01 Plan interface for systems integration.

34.0 Evaluate assigned business computer programming tasks. – The student will be able to:

- 34.01 Analyze computer resources necessary to run a program.

38.0 Develop an awareness of software quality assurance. – The student will be able to:

- 38.01 Evaluate performance, functionality, and validity of various software packages.

39.0 Implement enhanced program structures. – The student will be able to:

39.01 Write programs to import/export data from external sources.

40.0 Develop an understanding of programming techniques and concepts. – The student will be able to:

40.01 Identify object-oriented concepts and provide examples of objects in an object-oriented language.
40.02 Describe development methodologies, programming and system languages, database technologies, and data communication.

48.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

48.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
48.02 Explain emergency procedures to follow in response to workplace accidents.
48.03 Create a disaster and/or emergency response plan. SHE 2.0

49.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

49.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
49.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
49.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
49.04 Employ mentoring skills to inspire and teach others. LT 5.0

51.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

51.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
51.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
51.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
51.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
51.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
51.06 Identify and exhibit traits for retaining employment. ECD 7.0
51.07 Identify opportunities and research requirements for career advancement. ECD 8.0
51.08 Research the benefits of ongoing professional development. ECD 9.0
51.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

52.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

52.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
52.02 Describe the effect of money management on personal and career goals. FL 3.0

52.03	Develop a personal budget and financial goals.	FL3.1
52.04	Complete financial instruments for making deposits and withdrawals.	FL3.2
52.05	Maintain financial records.	FL3.3
52.06	Read and reconcile financial statements.	FL3.4
52.07	Research, compare and contrast investment opportunities.	

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Business Computer Programming 4**
Course Number: **8206040**
Course Credit: **1**

Course Description:

This course continues the study of computer programming concepts for business applications. The content includes client/server environments, interactive programming, and vendor application programming. After successful completion of Business Computer Programming 3 and 4, students will have met Occupational Completion Point C, Junior Programmer, SOC Code 15.1021.

Work-Based Learning

25.0 Participate in work-based learning experiences. – The student will be able to:

- 25.01 Participate in work-based learning experiences in a computer programming environment.
- 25.02 Compare and contrast programming languages used in a computer programming environment.
- 25.03 Discuss the management/supervisory skills needed in a computer programming environment.

Business Computer Programming

27.0 Identify functions of information processing. – The student will be able to:

- 27.01 Identify the advantages and disadvantages of blocking and buffering when accessing data on tape and disk storage.

31.0 Code programs. – The student will be able to:

- 31.01 Access external files in a client/server environment.

32.0 Perform program maintenance. – The student will be able to:

- 32.01 Modify or create new programs for vendor supplied applications.
- 32.02 Use a computer system with current commercial-end application software to solve problems within an organizational environment.

34.0 Evaluate assigned business computer programming tasks. – The student will be able to:

- 34.01 Utilize and apply project and time management tools to control systems development.

39.0 Implement enhanced program structures. – The student will be able to:

39.01 Write routines that incorporate “help” text.
39.02 Write interactive programs.
39.03 Design screen layouts for use in interactive programs.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Business Computer Programming 5**
Course Number: **8206050**
Course Credit: **1**

Course Description:

This course continues the study of computer programming concepts for business applications. The content includes client/server environments, interactive programming, and vendor application programming.

The competencies included in Business Programming 5 and 6 are designed to allow students to learn a second language. They build on the same tools as mastered in a previous language with increasing refinement of skill. Activities utilized must reflect increasingly greater complexity.

29.0 Test programs. – The student will be able to:

- 29.01 Develop a plan for testing programs.
- 29.02 Develop data for use in program testing.
- 29.03 Perform debugging activities.
- 29.04 Distinguish among the different types of program and design errors.
- 29.05 Evaluate program test results.
- 29.06 Execute programs and subroutines as they relate to the total application.
- 29.07 Use trace routines of compilers to assist in program debugging.
- 29.08 Compile and run programs.

30.0 Plan program design. – The student will be able to:

- 30.01 Formulate a plan to determine program specifications individually or in groups.
- 30.02 Use a graphical representation or pseudocode to represent the structure in a program or subroutine.
- 30.03 Design programs to solve problems using problem-solving strategies.
- 30.04 Prepare proper input/output layout specifications.
- 30.05 Examine existing utility programs and subroutines for use with other programs.
- 30.06 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.

31.0 Code programs. – The student will be able to:

- 31.01 Utilize reference manuals.
- 31.02 Write programs according to recognized programming standards.
- 31.03 Write internal documentation statements as needed in the program source code.
- 31.04 Code programs in high-level languages for business applications.
- 31.05 Write code that accesses sequential, indexed sequential, random, and direct files.
- 31.06 Code programs using logical statements (e.g., If-Then-Else, Do...While).
- 31.07 Enter and modify source code using a program language editor.

31.08 Code routines within programs that validate input data.
31.09 Use the rounding function in calculations within programs.

32.0 Perform program maintenance. – The student will be able to:

32.01 Review requested modification of programs and establish a plan of action.
32.02 Design needed modifications in conformance with established standards.
32.03 Code, test, and debug modifications prior to updating production code.
32.04 Update production programs and documentation with changes.
32.05 Analyze output to identify and annotate errors or enhancements.

33.0 Create and maintain documentation. – The student will be able to:

33.01 Write documentation to assist operators and end-users.
33.02 Follow established documentation standards.
33.03 Update existing documentation to reflect program changes.

34.0 Evaluate assigned business computer programming tasks. – The student will be able to:

34.01 Utilize and apply project and time management tools to control systems development.

39.0 Implement enhanced program structures. – The student will be able to:

39.01 Write programs that incorporate multi-level subtotals and page breaks.
39.02 Write programs that include tables or arrays and routines for data entry and lookup.
39.03 Write routines to sort arrays.
39.04 Write programs that sort records in files.
39.05 Write programs to create and maintain a master file.
39.06 Write programs to process transactions.
39.07 Write programs that use iteration.
39.08 Write programs that read and write sequential files.
39.09 Write programs that read and write indexed-sequential files.
39.10 Write programs that read and write random files.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Business Computer Programming 6**
Course Number: **8206060**
Course Credit: **1**

Course Description:

This course continues the study of computer programming concepts for business applications. The content includes client/server environments, interactive programming, and vendor application programming.

The competencies included in Business Programming 5 and 6 are designed to allow students to learn a second language. They build on the same tools as mastered in a previous language with increasing refinement of skill. Activities utilized must reflect increasingly greater complexity.

29.0 Test programs. – The student will be able to:

- 29.01 Develop a plan for system integration testing.

32.0 Perform program maintenance. – The student will be able to:

- 32.01 Modify or create new programs for vendor supplied applications.
- 32.02 Use a computer system with current commercial-end application software to solve problems within an organizational environment.

34.0 Evaluate assigned business computer programming tasks. – The student will be able to:

- 34.01 Utilize and apply project and time management tools to control systems development.
- 34.02 Analyze computer resources necessary to run a program.

37.0 Demonstrate an understanding of operating systems, environments, and platforms. – The student will be able to:

- 37.01 Assess and analyze the functions of different operating systems.
- 37.02 Assess and analyze the program development and execution utilities of relevant operating systems.

38.0 Develop an awareness of software quality assurance. – The student will be able to:

- 38.01 Evaluate performance, functionality, and validity of various software packages.

39.0 Implement enhanced program structures. – The student will be able to:

- 39.01 Write programs to import/export/convert data from external sources.
- 39.02 Write routines that incorporate “help” text.
- 39.03 Write interactive programs.

39.04 Design screen layouts for use in interactive programs.
39.05 Write programs using object-oriented languages.

40.0 Develop an understanding of programming techniques and concepts. – The student will be able to:
40.01 Describe development methodologies, programming and system languages, database technologies, and data communication.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Business Computer Programming 7**
Course Number: **8206070**
Course Credit: **1**

Course Description:

This course continues the study of computer programming concepts for business applications. The content includes client/server environments, interactive programming, and vendor application programming.

The competencies included in Business Programming 7 are designed to allow students to master a second language. They build on the same tools as mastered in a previous language with increasing refinement of skill. Activities utilized must reflect increasingly greater complexity.

29.0 Test programs. – The student will be able to:

- 29.01 Develop a plan for testing programs.
- 29.02 Develop a plan for system integration testing.
- 29.03 Develop data for use in program testing.
- 29.04 Perform debugging activities.
- 29.05 Distinguish among the different types of program and design errors.
- 29.06 Evaluate program test results.
- 29.07 Execute programs and subroutines as they relate to the total application.
- 29.08 Use trace routines of compilers to assist in program debugging.
- 29.09 Compile and run programs.

30.0 Plan program design. – The student will be able to:

- 30.01 Formulate a plan to determine program specifications individually or in groups.
- 30.02 Use a graphical representation or pseudocode to represent the structure in a program or subroutine.
- 30.03 Design programs to solve problems using problem-solving strategies.
- 30.04 Prepare proper input/output layout specifications.
- 30.05 Examine existing utility programs and subroutines for use with other programs.
- 30.06 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.

31.0 Code programs. – The student will be able to:

- 31.01 Utilize reference manuals.
- 31.02 Write programs according to recognized programming standards.
- 31.03 Write internal documentation statements as needed in the program source code.
- 31.04 Code programs in high-level languages for business applications.
- 31.05 Write code that accesses sequential, indexed sequential, random, and direct files.
- 31.06 Code programs using logical statements (e.g., If-Then-Else, Do...While).

31.07 Enter and modify source code using a program language editor.
31.08 Code routines within programs that validate input data.
31.09 Use the rounding function in calculations within programs.

32.0 Perform program maintenance. – The student will be able to:

32.01 Review requested modification of programs and establish a plan of action.
32.02 Design needed modifications in conformance with established standards.
32.03 Code, test, and debug modifications prior to updating production code.
32.04 Update production programs and documentation with changes.
32.05 Analyze output to identify and annotate errors or enhancements.

39.0 Implement enhanced program structures. – The student will be able to:

39.01 Write programs that include tables or arrays and routines for data entry and lookup.
39.02 Write programs that use iteration.
39.03 Write routines that incorporate “help” text.
39.04 Write programs that read and write sequential files.
39.05 Write programs that read and write indexed-sequential files.
39.06 Write programs that read and write random files.
39.07 Write interactive programs.
39.08 Design screen layouts for use in interactive programs.
39.09 Write programs using object-oriented languages.
39.10 Write programs that include data structures (e.g., stacks, queues, trees, linked lists).
39.11 Write programs that are event-driven.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Information Technology**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	8207300	Y300300
CIP Number	0507.030301	0507.030301
Grade Level	9-12, 30, 31	30, 31
Standard Length	5 credits	750 hours
Teacher Certification	BUS ED 1 @2 BUS DP @7 G ELECT DP @7 G COMPU SCI 6	BUS ED 1 @2 BUS DP @7 G ELECT DP @7 G COMPU SCI 6
CTSO	FBLA BPA	Phi Beta Lambda BPA
SOC Codes (all applicable)	15-1021; 15-1041	15-1021; 15-1041
Facility Code	212 http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	Mathematics: 9.0 Language: 9.0 Reading: 9.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to computer application skills including computer keyboarding, software applications (e.g., word processing, spreadsheet, database, presentation,

desktop publishing), e-mail, Internet browser applications, computer programming (e.g., Scheme, HTML), web page design and advanced web tools, systems support and maintenance, basic network concepts, basic concepts of relational database engines and the tools to use them, digital media (e.g., audio, video, graphics, text, and animation tools), and multimedia tools; extensive exploration of information technology careers; strategies for success including goal setting, study skills, organizing skills, learning styles, employability skills, and service learning; and core academic skills with a strong emphasis on effective communication skills.

Program Structure

This program is a planned sequence of instruction consisting of three occupational completion points.

When offered at the post secondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	OTA0040	Information Technology Assistant	150	15-1041
B	CTS0040 CTS0099	IT Programming and Database IT Technical Support & Networking	150 150	15-1021
C	CTS0079 CTS0940	IT Web & Digital Media IT Internship	150 150	15-1041

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8207310	Introduction to Information Technology	1 credit	15-1041	2
B	8207320 8203051	IT Programming/Database IT Technical Support/Networking	1 credit 1 credit	15-1021	3 3
C	8207360 8207350	IT Web/Digital Media IT Internship	1 credit 1 credit	15-1041	3 2

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

National Alignment

The Information Technology program aligns with the Academy of Information Technology model developed by the National Academy Foundation. In order to provide the true meaning of the Academy concept, a total interdisciplinary approach should be implemented. Instructional strategies for infusion of information technology concepts into the core academic subjects of language arts, math, science, and social studies are available through the National Academy Foundation. It is through a balanced and integrated curriculum that students attain the attitudes, skills, and knowledge needed to compete successfully in today's work force. To achieve total curriculum integration, academic and career and technical education Academy teachers should be scheduled with common planning times.

The Academy of Information Technology emphasizes the development of abilities and/or awareness necessary to function in a highly technological society. The use of cooperative learning groups is recommended. By learning and practicing group process skills, students will be prepared to work "together" in real work situations. Program graduates will develop enhanced self-esteem as well as the problem solving and teamwork skills necessary to succeed in careers and postsecondary education. Students will gain knowledge about career paths, have access to business role models, and have choices they would not otherwise have.

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills for secondary students. For postsecondary students, Phi Beta Lambda and BPA are the appropriate student organizations. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 9.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be

exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

The PSAV component of this program has no statewide articulation agreement approved by the Articulation Coordinating Committee. However, this does not preclude the awarding of credits by any college through local agreements.

For details on statewide articulation agreements which correlate to programs and industry certifications, refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to enhance the effectiveness of communication skills.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.
10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
11.0 Participate in work-based learning experiences.
12.0 Perform e-mail activities.
13.0 Demonstrate knowledge of different operating systems.
14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW.
15.0 Demonstrate proficiency using HTML commands.
16.0 Demonstrate proficiency in page design applicable to the WWW.
17.0 Demonstrate proficiency using specialized web design software.

18.0 Develop an awareness of the information technology industry.
19.0 Develop an awareness of microprocessors and digital computers.
20.0 Develop an awareness of programming languages.
21.0 Develop an awareness of emerging technologies.
22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model.
23.0 Demonstrate proficiency using common software applications.
24.0 Demonstrate proficiency using specialized software applications.
25.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing.
26.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
27.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.
28.0 Participate in work-based learning experiences.
29.0 Identify functions of information processing.
30.0 Identify functions of computers.
31.0 Test programs.
32.0 Plan program design.
33.0 Code programs.
34.0 Perform program maintenance.
35.0 Create and maintain documentation.
36.0 Develop an awareness of software quality assurance.
37.0 Develop an understanding of programming techniques and concepts.
38.0 Design structured programs.
39.0 Develop an awareness of the changes taking place in the information age and how they fit into an evolving society.
40.0 Develop the "big picture" of database design and how to best organize data according to business rules and/or client needs.
41.0 Develop the process of creating an entity by identifying relationships.
42.0 Formulate and assemble initial entity relationship by expanding on modeling concepts.
43.0 Consider the degree and optionality of relationships of entities.
44.0 Demonstrate proficiency in early construction stages of the data modeling process by using unique identifiers and many-to-many (M:M) relationships for building entity relationship diagrams.
45.0 Demonstrate proficiency in advanced data constructs by analyzing business requirements and diagramming entities and relationships.
46.0 Apply the complex ERM information by fine-tuning entities and the process for relating them.
47.0 Apply initial database design and normalization by following the set of house rules that determine how items are stored and retrieved.
48.0 Manipulating data.
49.0 Building and modifying tables.
50.0 Performing queries and filtering records.
51.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing.
52.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.

53.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.
54.0 Participate in work-based learning experiences.
55.0 Perform installation and configuration activities.
56.0 Demonstrate proficiency using computer networks.
57.0 Perform the process for problem diagnostics and problem resolution through telephone, e-mail, remote access, or direct contact.
58.0 Identify appropriate wide area network access strategies.
59.0 Identify appropriate local area network access strategies.
60.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing.
61.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
62.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.
63.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
64.0 Participate in work-based learning experiences.
65.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing.
66.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.
67.0 Participate in work-based learning experiences.
68.0 Demonstrate proficiency in page design applicable to the WWW.
69.0 Demonstrate knowledge of presentation production issues.
70.0 Demonstrate proficiency in using presentation software and equipment.
71.0 Demonstrate proficiency using video editing software and equipment.
72.0 Demonstrate proficiency in web page design applicable to the WWW.
73.0 Demonstrate proficiency in using a WYSIWG editor, web design, or web animation software for web page design.
74.0 Demonstrate proficiency in using digital photography and digital imaging.
75.0 Perform decision-making activities in a multimedia environment
76.0 Demonstrate language arts knowledge and skills.
77.0 Demonstrate mathematics knowledge and skills.
78.0 Demonstrate science knowledge and skills.
79.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
80.0 Solve problems using critical thinking skills, creativity and innovation.
81.0 Use information technology tools.
82.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
83.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
84.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
85.0 Describe the importance of professional ethics and legal responsibilities.
86.0 Explain the importance of employability skill and entrepreneurship skills.

87.0 Demonstrate personal money-management concepts, procedures, and strategies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Information Technology**
PSAV Number: **Y300300**

Course Number: OTA0040
Occupational Completion Point – A
Information Technology Assistant – 150 Hours – SOC Code 15-1021

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills. – The student will be able to:

- 03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
- 03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance. – The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.

08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace. – The student will be able to:

10.01 Accept constructive criticism.
10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences. – The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities. – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.
12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.
12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.

12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems. – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW. – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using HTML commands. – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the WWW. – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.

16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software. – The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry. – The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers. – The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages. – The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies. – The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.

21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model. – The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications. – The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications. – The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

76.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

76.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
76.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
76.03 Present information formally and informally for specific purposes and audiences. AF2.9

77.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

77.01 Demonstrate knowledge of arithmetic operations. AF3.2

77.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
77.03 Construct charts/tables/graphs using functions and data. AF3.5

78.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

78.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
78.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

Course Number: CTS0040
Occupational Completion Point – B
IT Programming & Database – 150 Hours – SOC Code 15-1021

Workplace Communications

25.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

25.01 Demonstrate active listening techniques.
25.02 Identify relevant information in oral messages.
25.03 Determine when more information is needed and ask appropriate questions.
25.04 Use professional business vocabulary appropriate for computer programming environments.
25.05 Organize ideas and communicate oral and written messages appropriate for computer programming environments.
25.06 Collaborate with individuals and teams to complete tasks and solve computer programming problems.
25.07 Apply the writing process to the creation of computer programming-related documents following designated business formats.
25.08 Use critical reading, analytical thinking, creative synthesis, and attention to detail as they relate to computer programming tasks.

26.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance. – The student will be able to:

26.01 Demonstrate an understanding of how computations work (e.g., precedence of mathematical and logical operators).
26.02 Solve computational problems in a systematic manner.

27.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

27.01 Analyze personal skills and aptitudes in comparison with computer programming career opportunities.

27.02 Refine and implement a plan to facilitate personal growth and skill development related to computer programming career opportunities.
27.03 Update and maintain an electronic career portfolio.
27.04 Research, compare and contrast career opportunities in computer programming and database administration.

28.0 Participate in work-based learning experiences. – The student will be able to:

28.01 Participate in work-based learning experiences in a computer programming environment.
28.02 Discuss the use of business computer programming technology in an information technology environment.

29.0 Identify functions of information processing. – The student will be able to:

29.01 Identify needs for software development in business.
29.02 Identify characteristics of object-oriented languages (techniques).

30.0 Identify functions of computers. – The student will be able to:

30.01 Identify computer hardware and software.
30.02 Identify generic data processing terminology.

31.0 Test programs. – The student will be able to:

31.01 Develop a plan for testing programs.
31.02 Develop data for use in program testing.
31.03 Perform debugging activities.
31.04 Distinguish among the different types of program and design errors.
31.05 Evaluate program test results.
31.06 Execute programs and subroutines as they relate to the total application.
31.07 Develop examples that illustrate the core behavior of each program.
31.08 Develop examples that illustrate the core behavior of each program component.
31.09 Illustrate the behavior of boundary cases.
31.10 Demonstrate an understanding that engineering artifacts requires rigorous and systematic testing.
31.11 Use examples to show that the solution meets pre-determined criteria.
31.12 Demonstrate understanding that testing can expose problems but not prove the correctness of the design in an absolute sense.
31.13 Compile (interpret) and run programs.

32.0 Plan program design. – The student will be able to:

32.01 Formulate a plan to determine program specifications individually or in groups.
32.02 Use a graphical representation or pseudocode to represent the structure in a program or subroutine.
32.03 Design programs to solve problems using problem-solving strategies.
32.04 Prepare proper input/output layout specifications.
32.05 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.
32.06 Analyze problem statements.

32.07 Determine what kind of information the desired program must process.
32.08 Formulate concise descriptions of a program's task and purpose.
32.09 Formulate concise descriptions of task and purpose of a program's pieces.
32.10 Organize programs according to the problem analysis.
32.11 Recognize changes in the problem statement.
32.12 Suggest changes in the program organization.

33.0 Code programs. – The student will be able to:

33.01 Write programs according to recognized programming standards.
33.02 Write internal documentation statements as needed in the program source code.
33.03 Code programs using logical statements (e.g., If-Then-Else, Do..While).
33.04 Enter and modify source code using a program language editor.
33.05 Code routines within programs that validate input data.
33.06 Code programs using object-oriented languages (techniques).
33.07 Select the essential aspects of a problem statement.
33.08 Provide a solution to a problem.
33.09 Find solutions to an extended problem statement.
33.10 Utilize reference manuals and help systems.
33.11 Use pre-defined functions within programs.

34.0 Perform program maintenance. – The student will be able to:

34.01 Analyze output to identify and annotate errors or enhancements.

35.0 Create and maintain documentation. – The student will be able to:

35.01 Follow established documentation standards.

36.0 Develop an awareness of software quality assurance. – The student will be able to:

36.01 Identify the legal and social consequences of errors in software.
36.02 Describe copyright and other laws that relate to software theft and misuse.
36.03 Describe software security measures to protect computer systems and data from unauthorized use and tampering (e.g., physical security, passwords, virus protection/prevention).

37.0 Develop an understanding of programming techniques and concepts. – The student will be able to:

37.01 Identify the basic constructs used in structured programming.

38.0 Design structured programs. – The student will be able to:

38.01 Design programs that model mathematical relationships from application areas (e.g., accounting, economics, multimedia, programming, science, web, etc.).
38.02 Design programs that deal with multi-faceted objects (e.g., personnel records, physical objects, attributes of HTML tags, etc.).
38.03 Design programs that deal with mixed classes of objects (e.g., a class of geometric shapes containing circles, rectangles, triangles, squares, polygons, etc.).

38.04 Design programs that deal with objects of undetermined size (e.g., shopping lists, family trees, file directories on computers, web sites, etc.).

39.0 Develop an awareness of the changes taking place in the information age and how they fit into an evolving society. – The student will be able to:

39.01 Describe the role a database plays in a business and predict its evolution.
39.02 Demonstrate the difference between “data” and “information.”
39.03 Understand the importance of clear communication when discussing business informational requirements.
39.04 Experiment with web-based email and explain how these services use a database.

40.0 Develop the "big picture" of database design and how to best organize data according to business rules and/or client needs. – The student will be able to:

40.01 Identify and analyze the phases of the database development process.
40.02 Explain what conceptual data modeling and database design involves.
40.03 Compare database development process with that of the application development process.
40.04 Identify the need for databases and why they are used.
40.05 Explain the various types of databases (i.e., flat file, relational) and the appropriate use of each.
40.06 Demonstrate proficiency in design methodology by completing appropriate tasks during the appropriate time of the developmental life cycle.
40.07 Demonstrate proficiency in design methodology by considering where the database will reside.

41.0 Develop the process of creating an entity by identifying relationships. – The student will be able to:

41.01 Identify and model various types of entities.
41.02 Identify naming and drawing conventions for entities.
41.03 Sequence the steps that are necessary for creation of an entity.
41.04 Analyze and model the relationships between entities.

42.0 Formulate and assemble initial entity relationship by expanding on modeling concepts. – The student will be able to:

42.01 Analyze and model attributes.
42.02 Identify unique identifiers for each entity.
42.03 Develop an entity relationship diagram tagging attributes with optionality.

43.0 Consider the degree and optionality of relationships of entities. – The student will be able to:

43.01 Create models and entity relationship information requirements and interviews.
43.02 Begin to differentiate between one-to-many, many-to-many and one-to-one relationships.
43.03 Identify relationship between two entities by reading a given diagram.
43.04 Create a relationship between instances of the same entity.

43.05 Read an entity relationship model in order to validate it.

44.0 Demonstrate proficiency in early construction stages of the data modeling process by using unique identifiers and many-to-many (M:M) relationships for building entity relationship diagrams. – The student will be able to:

44.01 Identify the significance of an attribute that has more than one value for each entity instance.
44.02 Evaluate appropriate methods of storing validation rules for attributes.
44.03 Recognize unique identifiers inherited from other entities.
44.04 Sequence the steps involved in resolving a many-to-many relationship.

45.0 Demonstrate proficiency in advanced data constructs by analyzing business requirements and diagramming entities and relationships -The student will be able to:

45.01 Validate that an attribute is properly placed based upon its dependence on its entity's unique identifier (UID).
45.02 Model advanced data constructs including recursive relationships, subtypes, and exclusive relationships.
45.03 Enforce referential integrity.

46.0 Apply the complex ERM information by fine-tuning entities and the process for relating them. – The student will be able to:

46.01 Describe a relational database and how it is different from other database systems.
46.02 Define primary keys and foreign keys and describe their purpose.
46.03 Describe what data integrity refers to and list some constraints.
46.04 Explain how database design fits into the database development process.
46.05 Translate an entity-relationship model into a relational database design.

47.0 Apply initial database design and normalization by following the set of house rules that determine how items are stored and retrieved. – The student will be able to:

47.01 Recognize raw data and evaluate the steps for creating a data group in unnormalized form (UNF).

48.0 Manipulating data. – The student will be able to:

48.01 Determine appropriate data inputs and outputs for an existing database.
48.02 Demonstrate proficiency in record management (i.e., entering, editing, finding, selecting, sorting, deleting records).
48.03 Change the layout of a datasheet.
48.04 Create forms, reports, mailing labels, and charts using a database.
48.05 Export data to appropriate software applications.
48.06 Demonstrate proficiency in coordinating databases with appropriate software applications.

49.0 Building and modifying tables. – The student will be able to:

49.01 Create a database table.

49.02 Create table structures and establish table relationships.
49.03 Determine fields and assign data types in a database table.
49.04 Demonstrate appropriate manipulation of database tables (i.e., enter data, add and delete records).
49.05 Modify a database table by adding, deleting, and removing fields.
49.06 Demonstrate proficiency in the appropriate use of database wizards.

50.0 Performing queries and filtering records. – The student will be able to:

50.01 Design a query and extract specific data from a database table.
50.02 Create a calculated field.
50.03 Filter data in records by selection and by form.
50.04 Modify a saved query.

79.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

79.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
79.02 Locate, organize and reference written information from various sources. CM 3.0
79.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
79.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
79.05 Apply active listening skills to obtain and clarify information. CM 7.0
79.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
79.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

80.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

80.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
80.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
80.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
80.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

81.0 Use information technology tools. – The student will be able to:

81.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
81.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
81.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
81.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

82.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

82.01 Describe the nature and types of business organizations. SY 1.0
82.02 Explain the effect of key organizational systems on performance and quality.
82.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
82.04 Explain the impact of the global economy on business organizations.

85.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

85.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
85.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
85.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
85.04 Interpret and explain written organizational policies and procedures. ELR 2.0

Course Number: CTS0099
Occupational Completion Point – B
IT Technical Support & Networking – 150 Hours – SOC Code 15-1021

51.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

51.01 Access reference materials.
51.02 Apply assertive service techniques.
51.03 Demonstrate interactive listening techniques.
51.04 Use professional business vocabulary appropriate for PC support services/networking environments.
51.05 Organize ideas and communicate oral and written messages appropriate for PC support services/networking environments.
51.06 Collaborate with individuals and teams to complete tasks and solve PC support services/networking problems.
51.07 Apply the writing process to the creation of PC support services/networking-related documents following designated business formats.
51.08 Apply appropriate communication etiquette in responding to user requests for assistance in a timely manner.
51.09 Demonstrate patience, active listening skills, and probing skills in responding to user requests for assistance.

52.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

52.01 Develop diplomatic methods to communicate with customers.

53.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

53.01 Research, compare and contrast career opportunities in PC and network support.
53.02 Analyze personal skills and aptitudes in comparison with PC and network support career opportunities.
53.03 Refine and implement a plan to facilitate personal growth and skill development related to PC and network support career opportunities.
53.04 Update and maintain an electronic career portfolio.

54.0 Participate in work-based learning experiences. – The student will be able to:

54.01 Participate in work-based learning experiences in a PC support/networking information technology environment.
54.02 Discuss the application of PC support and networking principles in an information technology environment.
54.03 Discuss the use of PC support and networking technology in an information technology environment.
54.04 Discuss the use of technology in a network support services environment.
54.05 Discuss the management/supervisory skills needed in a network support services environment.

55.0 Perform installation and configuration activities. – The student will be able to:

55.01 Install and configure software including device drivers.
55.02 Install and configure operating system software.
55.03 Install and configure application software.
55.04 Install and configure peripherals including device drivers (e.g., scanners, cameras, printers).
55.05 Supervise the testing of operating system management systems (e.g., registry, INI files).
55.06 Prepare the hard disk and related issues for operating system installation (e.g., BIOS, disk controllers).
55.07 Format and partition the hard disk.
55.08 Verify the proper operation of the system (e.g., physical inspection, tests, utilities).
55.09 Compare and contrast memory technologies (e.g., RAM, ROM, virtual memory, memory management)
55.10 Demonstrate proficiency using various memory technologies (e.g., RAM, ROM, virtual memory, memory management).

56.0 Demonstrate proficiency using computer networks. – The student will be able to:

56.01 Define networking and describe the purpose of a network.
56.02 Describe the conceptual background of digital networks including terminology and basics.
56.03 Compare and contrast various implementation models (e.g., TCP/IP protocols, OSI 7, NetBEUI, PX, cross mapping of protocols).
56.04 Describe various networks and the advantages and disadvantages of each (e.g., peer to peer, client/server, mainframe/terminal).
56.05 Describe the use and advantages and disadvantages of various network media (e.g., thinnet cable (coaxial), twisted pair (category 5), fiber optic).

56.06 Describe class A, B, C networks and their relationship to the TCP/IP dotted decimal addressing.
56.07 Describe an Ethernet network and the use of CSMA\CD.
56.08 Describe the function of various network devices (e.g., hub, switched hub or switch, router bridge, gateway).

57.0 Perform the process for problem diagnostics and problem resolution through telephone, e-mail, remote access, or direct contact. – The student will be able to:

57.01 Identify, troubleshoot and propose solutions for configuration problems.
57.02 Identify, troubleshoot and propose solutions for software problems.
57.03 Identify, troubleshoot and propose solutions for hardware malfunctions.
57.04 Identify, troubleshoot and propose solutions for network malfunctions.
57.05 Plan and implement a system upgrade and downgrade.
57.06 Evaluate data recovery using various techniques (e.g., MBR repair tools, rescue disks, disk image, backup).
57.07 Organize and perform system maintenance activities (e.g., management console, SNMP, system monitors, diagnostics, virus management).
57.08 Demonstrate corporate interaction proficiency (e.g., responsibility, interaction, communication).

58.0 Identify appropriate wide area network access strategies. – The student will be able to:

58.01 Compare and contrast various types of host access (e.g., leased lines, service providers, ISP's, DSL's, cable modems, wireless service providers).
58.02 Compare and contrast various types of connections (e.g., dial up, network interface cards, crossover cables, straight through cables, null modem cables, client server) with a hub and wireless connections.

59.0 Identify appropriate local area network access strategies. – The student will be able to:

59.01 Compare and contrast various local area networks (e.g., token ring, Ethernet, Apple Talk).
59.02 Compare and contrast various local area connections (e.g., Banyan vines, Novell, Windows NT, Windows 2000).

83.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

83.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
83.02 Explain emergency procedures to follow in response to workplace accidents.
83.03 Create a disaster and/or emergency response plan. SHE 2.0

84.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

84.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
84.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0

84.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
84.04 Employ mentoring skills to inspire and teach others. LT 5.0

86.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

86.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
86.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
86.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
86.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
86.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
86.06 Identify and exhibit traits for retaining employment. ECD 7.0
86.07 Identify opportunities and research requirements for career advancement. ECD 8.0
86.08 Research the benefits of ongoing professional development. ECD 9.0
86.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

87.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

87.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
87.02 Describe the effect of money management on personal and career goals. FL 3.0
87.03 Develop a personal budget and financial goals. FL3.1
87.04 Complete financial instruments for making deposits and withdrawals. FL3.2
87.05 Maintain financial records. FL3.3
87.06 Read and reconcile financial statements. FL3.4
87.07 Research, compare and contrast investment opportunities.

Course Number: CTS0940
Occupational Completion Point – C
IT Internship – 150 Hours – SOC Code 15-1041

60.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

60.01 Demonstrate effective written and oral communication and listening skills in a workplace environment
60.02 Use professional business vocabulary related to information technology environments.

61.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

61.01 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.
61.02 Demonstrate the ability to resolve customer, employee, and employee/employer problems and concerns.

61.03 Demonstrate acceptable work habits and conduct in the workplace as defined by company policy.
61.04 Demonstrate legal and ethical behavior within the scope of job responsibilities.
61.05 Apply a positive customer service attitude.
61.06 Demonstrate an understanding of the organization's mission and services.

62.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

62.01 Update and maintain an electronic career portfolio.
62.02 Create an electronic resume.
62.03 Apply for an information technology position using a letter of application and resume.
62.04 Demonstrate successful interview techniques for an information technology position.

63.0 Demonstrate human relations/interpersonal skills appropriate for the workplace. – The student will be able to:

63.01 Exhibit behavior supporting and promoting cultural and ethnic diversity.
63.02 Demonstrate interpersonal skills that enhance team productivity and foster positive work ethics.
63.03 Demonstrate appropriate dress and grooming for the workplace environment.

64.0 Participate in work-based learning experiences. – The student will be able to:

64.01 Perform tasks as outlined in the job performance skills plan.
64.02 Display an acceptable level of productivity and quality control in an information technology position.
64.03 Maintain appropriate records.

Course Number: CTS0079
Occupational Completion Point – C
IT Web & Digital Media – 150 Hours – SOC Code 15-1041

65.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

65.01 Use professional business vocabulary appropriate for multimedia information technology environments.
65.02 Organize ideas and communicate oral and written messages appropriate for multimedia information technology environments.
65.03 Collaborate with individuals and teams to complete tasks and solve multimedia information technology problems.
65.04 Apply the writing process to the creation of multimedia-related documents following designated business formats.

66.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

66.01 Update and maintain an electronic career portfolio.
66.02 Research, compare, and contrast career opportunities in web and multimedia design.
66.03 Analyze personal skills and aptitudes in comparison with web and multimedia design career opportunities.
66.04 Refine and implement a plan to facilitate personal growth and skill development related to web and multimedia design career opportunities.
66.05 Present an electronic career portfolio to an audience.
66.06 Update an electronic resume.
66.07 Conduct a comprehensive job search.
66.08 Develop a postsecondary education plan to prepare for an information technology career.

67.0 Participate in work-based learning experiences. – The student will be able to:

67.01 Participate in work-based learning experiences in a multimedia information technology environment.
67.02 Discuss the application of multimedia design principles in an information technology environment.
67.03 Discuss the use of multimedia design technology in an information technology environment.

68.0 Demonstrate proficiency in page design applicable to the WWW. – The student will be able to:

68.01 Identify and convert graphic formats.
68.02 Demonstrate proficiency in adding Java scripts to web pages.

69.0 Demonstrate knowledge of presentation production issues. – The student will be able to:

69.01 Demonstrate knowledge of copyright laws including copyright statute, disclaimers, and filing procedure.
69.02 Demonstrate an understanding of graphic and other file formats (e.g., EPS, TIFF, JPEG, ASCII, MPEG, MIDI, AVI, WAV, etc.) and knowledge of image size when scanning and saving files for use in different presentation types (Web, computer, print, etc.).
69.03 Demonstrate knowledge of presentation vocabulary/terms.
69.04 Compare and contrast and utilize various audio/video output solutions and devices (e.g., DVD, CD-Rom, web).

70.0 Demonstrate proficiency in using presentation software and equipment. – The student will be able to:

70.01 Produce a presentation that includes music, animation, and digital photography and present it using a projection system.

70.02 Using presentation software, create a multimedia presentation that incorporates shot and edited video, animation, music, narration and adheres to good design principles, use of transitions, and effective message conveyance.
70.03 Demonstrate knowledge of the roles and responsibilities of a multimedia production team (e.g. project manager, creative or design director, content experts, writers, graphic designers, animators, sound designers, videographer, interface designers/ programmers, etc.)
70.04 Collaborate with team members to plan, edit, evaluate, and present a multimedia presentation where individuals on the team function in specific production roles that were outlined in mastery of 201.03.
70.05 Create a self-running presentation with synchronized audio, convert presentation slides (e.g., PowerPoint) into streaming ASF files for use on the Web.
70.06 Create and edit an animation that includes text, symbols, layers, buttons, and tweened animation.
70.07 Construct web pages with streaming media content.

71.0 Demonstrate proficiency using video editing software and equipment. – The student will be able to:

71.01 Demonstrate knowledge of video and sound editing vocabulary, terms, and acronyms.
71.02 Demonstrate knowledge of non-linear editing software (NLEs) and compare the strengths and weaknesses of these programs.
71.03 Identify components of non-linear video editing equipment.
71.04 Set-up non-linear video editing equipment.
71.05 Compare offline to “real time” video editing.
71.06 Use storyboarding to plan a short nonlinear video project that includes existing video footage with a title, transitions, background sound, voice-over, animation, and rolling credits.
71.07 Create and edit a movie using video editing software that includes existing video footage with a title, transitions, background sound, voice-over, and rolling credits and output to video.
71.08 Collaborate with team members to plan, edit, and shoot video footage utilizing advanced video editing techniques and output to video.
71.09 Compare and contrast single track vs. multi-track audio/video editors.
71.10 Compose and edit sound tracks.

72.0 Demonstrate proficiency in web page design applicable to the WWW. – The student will be able to:

72.01 Determine the objectives and the audience for Web pages.
72.02 Identify design strategies to reach and keep an audience.
72.03 Use storyboarding to plan a Web site.
72.04 Create styles and other design elements (e.g. backgrounds, colors, fonts, buttons, etc.).

73.0 Demonstrate proficiency in using a WYSIWG editor, web design, or web animation software for web page design. – The student will be able to:

73.01 Apply style sheets for consistent Web site design.

73.02 Create and edit images and photographs for Web pages using digital imaging software (e.g., ImageReady in Photoshop).
73.03 Insert audio files into a Web page.
73.04 Create, edit and integrate video files into a Web page.
73.05 Create, edit and integrate animation files into a Web page.
73.06 Demonstrate an understanding of photograph compression factors such as transmission speed, color reduction, and browser support.
73.07 Build, optimize, edit, and test web pages for publication.
73.08 Create a web page that utilizes plug-ins.
73.09 Demonstrate an understanding of network and web implementation issues (e.g., bandwidth, compression, streaming).
73.10 Compare and contrast various methods by which information may be accessed on the Internet/Intranet (e.g., FTP, telnet, browser).
73.11 Demonstrate an understanding of file encryption methods (e.g., secure server, unsecured server).

74.0 Demonstrate proficiency in using digital photography and digital imaging. – The student will be able to:

74.01 Demonstrate knowledge of ethics related to digital imaging and legal and consent issues.
74.02 Apply effective design principles in digital photography compositions.
74.03 Demonstrate skill in using digital imaging software for image manipulation, color correction, and special effects to creatively convey a message or literary interpretation.
74.04 Compare and contrast still raster and still vector graphics.

75.0 Perform decision-making activities in a multimedia environment. – The student will be able to:

75.01 Determine work priorities, the audience, project budgets, project specifications, and the production schedule.
75.02 Evaluate and select appropriate software packages and multimedia tools to complete assigned tasks.
75.03 Present and defend design projects.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Introduction to Information Technology**
Course Number: **8207310**
Course Credit: **1**

Course Description:

This course is designed to provide an introduction to information technology concepts and careers as well as the impact information technology has on the world, people, and industry and basic web design concepts. The content includes information technology career research; operating systems and software applications; electronic communications including e-mail and Internet services; basic HTML, DHTML, and XML web commands and design; emerging technologies, and Web page design.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance. – The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

- 08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

- 09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
- 09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
- 09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
- 09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
- 09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace. – The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences. – The student will be able to:

- 11.01 Participate in work-based learning experiences in an information technology environment.
- 11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities. – The student will be able to:

- 12.01 Describe e-mail capabilities and functions.
- 12.02 Identify components of an e-mail message.
- 12.03 Identify the components of an e-mail address.
- 12.04 Identify when to use different e-mail options.
- 12.05 Attach a file to an e-mail message.
- 12.06 Forward an e-mail message.

12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems. – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW. – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using html commands. – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the WWW. – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software. – The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry. – The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers. – The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages. – The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies. – The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model. – The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications. – The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications. – The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

76.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

76.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
76.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5

76.03 Present information formally and informally for specific purposes and audiences. AF2.9

77.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

77.01 Demonstrate knowledge of arithmetic operations. AF3.2
77.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
77.03 Construct charts/tables/graphs using functions and data. AF3.5

78.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

78.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
78.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **IT Programming/Database**
Course Number: **8207320**
Course Credit: **1**

Course Description:

This course introduces computer programming concepts for information technology applications using the Scheme programming language and an introduction to database fundamentals. The content includes information technology career research, computer functions, programming techniques and concepts, data modeling and advanced database techniques. Emphasis is placed on the techniques needed to develop well-documented, structured computer programs.

25.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

- 25.01 Demonstrate active listening techniques.
- 25.02 Identify relevant information in oral messages.
- 25.03 Determine when more information is needed and ask appropriate questions.
- 25.04 Use professional business vocabulary appropriate for computer programming environments.
- 25.05 Organize ideas and communicate oral and written messages appropriate for computer programming environments.
- 25.06 Collaborate with individuals and teams to complete tasks and solve computer programming problems.
- 25.07 Apply the writing process to the creation of computer programming-related documents following designated business formats.
- 25.08 Use critical reading, analytical thinking, creative synthesis, and attention to detail as they relate to computer programming tasks.

26.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance. – The student will be able to:

- 26.01 Demonstrate an understanding of how computations work (e.g., precedence of mathematical and logical operators).
- 26.02 Solve computational problems in a systematic manner.

27.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

- 27.01 Analyze personal skills and aptitudes in comparison with computer programming career opportunities.
- 27.02 Refine and implement a plan to facilitate personal growth and skill development related to computer programming career opportunities.
- 27.03 Update and maintain an electronic career portfolio.
- 27.04 Research, compare and contrast career opportunities in computer programming

and database administration.

28.0 Participate in work-based learning experiences. – The student will be able to:

28.01 Participate in work-based learning experiences in a computer programming environment.
28.02 Discuss the use of business computer programming technology in an information technology environment.

29.0 Identify functions of information processing. – The student will be able to:

29.01 Identify needs for software development in business.
29.02 Identify characteristics of object-oriented languages (techniques).

30.0 Identify functions of computers. – The student will be able to:

30.01 Identify computer hardware and software.
30.02 Identify generic data processing terminology.

31.0 Test programs. – The student will be able to:

31.01 Develop a plan for testing programs.
31.02 Develop data for use in program testing.
31.03 Perform debugging activities.
31.04 Distinguish among the different types of program and design errors.
31.05 Evaluate program test results.
31.06 Execute programs and subroutines as they relate to the total application.
31.07 Develop examples that illustrate the core behavior of each program.
31.08 Develop examples that illustrate the core behavior of each program component.
31.09 Illustrate the behavior of boundary cases.
31.10 Demonstrate an understanding that engineering artifacts requires rigorous and systematic testing.
31.11 Use examples to show that the solution meets pre-determined criteria.
31.12 Demonstrate understanding that testing can expose problems but not prove the correctness of the design in an absolute sense.
31.13 Compile (interpret) and run programs.

32.0 Plan program design. – The student will be able to:

32.01 Formulate a plan to determine program specifications individually or in groups.
32.02 Use a graphical representation or pseudocode to represent the structure in a program or subroutine.
32.03 Design programs to solve problems using problem-solving strategies.
32.04 Prepare proper input/output layout specifications.
32.05 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.
32.06 Analyze problem statements.
32.07 Determine what kind of information the desired program must process.
32.08 Formulate concise descriptions of a program's task and purpose.
32.09 Formulate concise descriptions of task and purpose of a program's pieces.
32.10 Organize programs according to the problem analysis.

32.11 Recognize changes in the problem statement.
32.12 Suggest changes in the program organization.

33.0 Code programs. – The student will be able to:

33.01 Write programs according to recognized programming standards.
33.02 Write internal documentation statements as needed in the program source code.
33.03 Code programs using logical statements (e.g., If-Then-Else, Do..While).
33.04 Enter and modify source code using a program language editor.
33.05 Code routines within programs that validate input data.
33.06 Code programs using object-oriented languages (techniques).
33.07 Select the essential aspects of a problem statement.
33.08 Provide a solution to a problem.
33.09 Find solutions to an extended problem statement.
33.10 Utilize reference manuals and help systems.
33.11 Use pre-defined functions within programs.

34.0 Perform program maintenance. – The student will be able to:

34.01 Analyze output to identify and annotate errors or enhancements.

35.0 Create and maintain documentation. – The student will be able to:

35.01 Follow established documentation standards.

36.0 Develop an awareness of software quality assurance. – The student will be able to:

36.01 Identify the legal and social consequences of errors in software.
36.02 Describe copyright and other laws that relate to software theft and misuse.
36.03 Describe software security measures to protect computer systems and data from unauthorized use and tampering (e.g., physical security, passwords, virus protection/prevention).

37.0 Develop an understanding of programming techniques and concepts. – The student will be able to:

37.01 Identify the basic constructs used in structured programming.

38.0 Design structured programs. – The student will be able to:

38.01 Design programs that model mathematical relationships from application areas (e.g., accounting, economics, multimedia, programming, science, web, etc.).
38.02 Design programs that deal with multi-faceted objects (e.g., personnel records, physical objects, attributes of HTML tags, etc.).
38.03 Design programs that deal with mixed classes of objects (e.g., a class of geometric shapes containing circles, rectangles, triangles, squares, polygons, etc.).
38.04 Design programs that deal with objects of undetermined size (e.g., shopping lists, family trees, file directories on computers, web sites, etc.).

39.0 Develop an awareness of the changes taking place in the information age and how they

fit into an evolving society. – The student will be able to:

39.01 Describe the role a database plays in a business and predict its evolution.
39.02 Demonstrate the difference between “data” and “information.”
39.03 Understand the importance of clear communication when discussing business informational requirements.
39.04 Experiment with web-based email and explain how these services use a database.

40.0 Develop the "big picture" of database design and how to best organize data according to business rules and/or client needs. – The student will be able to:

40.01 Identify and analyze the phases of the database development process.
40.02 Explain what conceptual data modeling and database design involves.
40.03 Compare database development process with that of the application development process.
40.04 Identify the need for databases and why they are used.
40.05 Explain the various types of databases (i.e., flat file, relational) and the appropriate use of each.
40.06 Demonstrate proficiency in design methodology by completing appropriate tasks during the appropriate time of the developmental life cycle.
40.07 Demonstrate proficiency in design methodology by considering where the database will reside.

41.0 Develop the process of creating an entity by identifying relationships. – The student will be able to:

41.01 Identify and model various types of entities.
41.02 Identify naming and drawing conventions for entities.
41.03 Sequence the steps that are necessary for creation of an entity.
41.04 Analyze and model the relationships between entities.

42.0 Formulate and assemble initial entity relationship by expanding on modeling concepts. – The student will be able to:

42.01 Analyze and model attributes.
42.02 Identify unique identifiers for each entity.
42.03 Develop an entity relationship diagram tagging attributes with optionality.

43.0 Consider the degree and optionality of relationships of entities. – The student will be able to:

43.01 Create models and entity relationship information requirements and interviews.
43.02 Begin to differentiate between one-to-many, many-to-many and one-to-one relationships.
43.03 Identify relationship between two entities by reading a given diagram.
43.04 Create a relationship between instances of the same entity.
43.05 Read an entity relationship model in order to validate it.

44.0 Demonstrate proficiency in early construction stages of the data modeling process by using unique identifiers and many-to-many (M:M) relationships for building entity relationship diagrams. – The student will be able to:

- 44.01 Identify the significance of an attribute that has more than one value for each entity instance.
- 44.02 Evaluate appropriate methods of storing validation rules for attributes.
- 44.03 Recognize unique identifiers inherited from other entities.
- 44.04 Sequence the steps involved in resolving a many-to-many relationship.

45.0 Demonstrate proficiency in advanced data constructs by analyzing business requirements and diagramming entities and relationships. – The student will be able to:

- 45.01 Validate that an attribute is properly placed based upon its dependence on its entity's unique identifier (UID).
- 45.02 Model advanced data constructs including recursive relationships, subtypes, and exclusive relationships.
- 45.03 Enforce referential integrity.

46.0 Apply the complex ERM information by fine-tuning entities and the process for relating them. – The student will be able to:

- 46.01 Describe a relational database and how it is different from other database systems.
- 46.02 Define primary keys and foreign keys and describe their purpose.
- 46.03 Describe what data integrity refers to and list some constraints.
- 46.04 Explain how database design fits into the database development process.
- 46.05 Translate an entity-relationship model into a relational database design.

47.0 Apply initial database design and normalization by following the set of house rules that determine how items are stored and retrieved. – The student will be able to:

- 47.01 Recognize raw data and evaluate the steps for creating a data group in unnormalized form (UNF).

48.0 Manipulating data. – The student will be able to:

- 48.01 Determine appropriate data inputs and outputs for an existing database.
- 48.02 Demonstrate proficiency in record management (i.e., entering, editing, finding, selecting, sorting, deleting records).
- 48.03 Change the layout of a datasheet.
- 48.04 Create forms, reports, mailing labels, and charts using a database.
- 48.05 Export data to appropriate software applications.
- 48.06 Demonstrate proficiency in coordinating databases with appropriate software applications.

49.0 Building and modifying tables. – The student will be able to:

- 49.01 Create a database table.
- 49.02 Create table structures and establish table relationships.
- 49.03 Determine fields and assign data types in a database table.

49.04 Demonstrate appropriate manipulation of database tables (i.e., enter data, add and delete records).
49.05 Modify a database table by adding, deleting, and removing fields.
49.06 Demonstrate proficiency in the appropriate use of database wizards.

50.0 Performing queries and filtering records. – The student will be able to:

50.01 Design a query and extract specific data from a database table.
50.02 Create a calculated field.
50.03 Filter data in records by selection and by form.
50.04 Modify a saved query.

79.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

79.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
79.02 Locate, organize and reference written information from various sources. CM 3.0
79.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
79.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
79.05 Apply active listening skills to obtain and clarify information. CM 7.0
79.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
79.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

80.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

80.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
80.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
80.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
80.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

81.0 Use information technology tools. – The student will be able to:

81.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
81.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
81.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
81.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

82.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

82.01 Describe the nature and types of business organizations. SY 1.0

82.02 Explain the effect of key organizational systems on performance and quality.
82.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
82.04 Explain the impact of the global economy on business organizations.

85.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

85.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
85.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
85.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
85.04 Interpret and explain written organizational policies and procedures. ELR 2.0

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **IT Technical Support/Networking**
Course Number: **8203051**
Course Credit: **1**

Course Description:

This course focuses on system support, maintenance, and basic network concepts. The content includes information technology career research and emphasis is placed on developing an understanding of various computer software and hardware applications including installation, troubleshooting, diagnostic techniques, and repair of system components, operating systems, and application software; common safety and preventive maintenance procedures; basic networking including physical and logical network connectivity; and effective behaviors that contribute to customer satisfaction.

51.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

- 51.01 Access reference materials.
- 51.02 Apply assertive service techniques.
- 51.03 Demonstrate interactive listening techniques.
- 51.04 Use professional business vocabulary appropriate for PC support services/networking environments.
- 51.05 Organize ideas and communicate oral and written messages appropriate for PC support services/networking environments.
- 51.06 Collaborate with individuals and teams to complete tasks and solve PC support services/networking problems.
- 51.07 Apply the writing process to the creation of PC support services/networking-related documents following designated business formats.
- 51.08 Apply appropriate communication etiquette in responding to user requests for assistance in a timely manner.
- 51.09 Demonstrate patience, active listening skills, and probing skills in responding to user requests for assistance.

52.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

- 52.01 Develop diplomatic methods to communicate with customers.

53.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

- 53.01 Research, compare and contrast career opportunities in PC and network support.
- 53.02 Analyze personal skills and aptitudes in comparison with PC and network support career opportunities.

53.03 Refine and implement a plan to facilitate personal growth and skill development related to PC and network support career opportunities.
53.04 Update and maintain an electronic career portfolio.

54.0 Participate in work-based learning experiences. – The student will be able to:

54.01 Participate in work-based learning experiences in a PC support/networking information technology environment.
54.02 Discuss the application of PC support and networking principles in an information technology environment.
54.03 Discuss the use of PC support and networking technology in an information technology environment.
54.04 Discuss the use of technology in a network support services environment.
54.05 Discuss the management/supervisory skills needed in a network support services environment.

55.0 Perform installation and configuration activities. – The student will be able to:

55.01 Install and configure software including device drivers.
55.02 Install and configure operating system software.
55.03 Install and configure application software.
55.04 Install and configure peripherals including device drivers (e.g., scanners, cameras, printers).
55.05 Supervise the testing of operating system management systems (e.g., registry, INI files).
55.06 Prepare the hard disk and related issues for operating system installation (e.g., BIOS, disk controllers).
55.07 Format and partition the hard disk.
55.08 Verify the proper operation of the system (e.g., physical inspection, tests, utilities).
55.09 Compare and contrast memory technologies (e.g., RAM, ROM, virtual memory, memory management)
55.10 Demonstrate proficiency using various memory technologies (e.g., RAM, ROM, virtual memory, memory management).

56.0 Demonstrate proficiency using computer networks. – The student will be able to:

56.01 Define networking and describe the purpose of a network.
56.02 Describe the conceptual background of digital networks including terminology and basics.
56.03 Compare and contrast various implementation models (e.g., TCP/IP protocols, OSI 7, NetBEUI, PX, cross mapping of protocols).
56.04 Describe various networks and the advantages and disadvantages of each (e.g., peer to peer, client/server, mainframe/terminal).
56.05 Describe the use and advantages and disadvantages of various network media (e.g., thinnet cable (coaxial), twisted pair (category 5), fiber optic).
56.06 Describe class A, B, C networks and their relationship to the TCP/IP dotted decimal addressing.
56.07 Describe an Ethernet network and the use of CSMA\CD.
56.08 Describe the function of various network devices (e.g., hub, switched hub or switch, router bridge, gateway).

57.0 Perform the process for problem diagnostics and problem resolution through telephone, e-mail, remote access, or direct contact. – The student will be able to:

- 57.01 Identify, troubleshoot and propose solutions for configuration problems.
- 57.02 Identify, troubleshoot and propose solutions for software problems.
- 57.03 Identify, troubleshoot and propose solutions for hardware malfunctions.
- 57.04 Identify, troubleshoot and propose solutions for network malfunctions.
- 57.05 Plan and implement a system upgrade and downgrade.
- 57.06 Evaluate data recovery using various techniques (e.g., MBR repair tools, rescue disks, disk image, backup).
- 57.07 Organize and perform system maintenance activities (e.g., management console, SNMP, system monitors, diagnostics, virus management).
- 57.08 Demonstrate corporate interaction proficiency (e.g., responsibility, interaction, communication).

58.0 Identify appropriate wide area network access strategies. – The student will be able to:

- 58.01 Compare and contrast various types of host access (e.g., leased lines, service providers, ISP's, DSL's, cable modems, wireless service providers).
- 58.02 Compare and contrast various types of connections (e.g., dial up, network interface cards, crossover cables, straight through cables, null modem cables, client server) with a hub and wireless connections.

59.0 Identify appropriate local area network access strategies. – The student will be able to:

- 59.01 Compare and contrast various local area networks (e.g., token ring, Ethernet, Apple Talk).
- 59.02 Compare and contrast various local area connections (e.g., Banyan vines, Novell, Windows NT, Windows2000).

83.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

- 83.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
- 83.02 Explain emergency procedures to follow in response to workplace accidents.
- 83.03 Create a disaster and/or emergency response plan. SHE 2.0

84.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

- 84.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
- 84.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
- 84.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
- 84.04 Employ mentoring skills to inspire and teach others. LT 5.0

86.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

86.01	Identify and demonstrate positive work behaviors needed to be employable.	ECD 1.0
86.02	Develop personal career plan that includes goals, objectives, and strategies.	ECD 2.0
86.03	Examine licensing, certification, and industry credentialing requirements.	ECD 3.0
86.04	Maintain a career portfolio to document knowledge, skills, and experience.	ECD 5.0
86.05	Evaluate and compare employment opportunities that match career goals.	ECD 6.0
86.06	Identify and exhibit traits for retaining employment.	ECD 7.0
86.07	Identify opportunities and research requirements for career advancement.	ECD 8.0
86.08	Research the benefits of ongoing professional development.	ECD 9.0
86.09	Examine and describe entrepreneurship opportunities as a career planning option.	ECD 10.0

87.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

87.01	Identify and describe the services and legal responsibilities of financial institutions.	FL 2.0
87.02	Describe the effect of money management on personal and career goals.	FL 3.0
87.03	Develop a personal budget and financial goals.	FL3.1
87.04	Complete financial instruments for making deposits and withdrawals.	FL3.2
87.05	Maintain financial records.	FL3.3
87.06	Read and reconcile financial statements.	FL3.4
87.07	Research, compare and contrast investment opportunities.	

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **IT Internship**
Course Number: **8207350**
Course Credit: **1**

Course Description:

The IT internship course provides students with the opportunity to stimulate their career interest and to demonstrate human relations, communications, and employability skills necessary for entry-level employment in the information technology industry. Students will enhance and apply instructional competencies learned in the classroom through the internship experience.

60.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

- 60.01 Demonstrate effective written and oral communication and listening skills in a workplace environment
- 60.02 Use professional business vocabulary related to information technology environments.

61.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

- 61.01 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.
- 61.02 Demonstrate the ability to resolve customer, employee, and employee/employer problems and concerns.
- 61.03 Demonstrate acceptable work habits and conduct in the workplace as defined by company policy.
- 61.04 Demonstrate legal and ethical behavior within the scope of job responsibilities.
- 61.05 Apply a positive customer service attitude.
- 61.06 Demonstrate an understanding of the organization's mission and services.

62.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

- 62.01 Update and maintain an electronic career portfolio.
- 62.02 Create an electronic resume.
- 62.03 Apply for an information technology position using a letter of application and resume.
- 62.04 Demonstrate successful interview techniques for an information technology position.

63.0 Demonstrate human relations/interpersonal skills appropriate for the workplace. – The student will be able to:

63.01 Exhibit behavior supporting and promoting cultural and ethnic diversity.
63.02 Demonstrate interpersonal skills that enhance team productivity and foster positive work ethics.
63.03 Demonstrate appropriate dress and grooming for the workplace environment.

64.0 Participate in work-based learning experiences. – The student will be able to:

64.01 Perform tasks as outlined in the job performance skills plan.
64.02 Display an acceptable level of productivity and quality control in an information technology position.
64.03 Maintain appropriate records.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **IT Web/Digital Media**
Course Number: **8207360**
Course Credit: **1**

Course Description:

This course focuses on digital media and advanced web tools. The content includes information technology career research; advanced HTML, DHTML, and XML commands and web page design; advanced web topics such as web scripting and web server administration; and basic multimedia applications including audio, video, graphics, text, and animation tools.

65.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

- 65.01 Use professional business vocabulary appropriate for multimedia information technology environments.
- 65.02 Organize ideas and communicate oral and written messages appropriate for multimedia information technology environments.
- 65.03 Collaborate with individuals and teams to complete tasks and solve multimedia information technology problems.
- 65.04 Apply the writing process to the creation of multimedia-related documents following designated business formats.

66.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

- 66.01 Update and maintain an electronic career portfolio.
- 66.02 Research, compare, and contrast career opportunities in web and multimedia design.
- 66.03 Analyze personal skills and aptitudes in comparison with web and multimedia design career opportunities.
- 66.04 Refine and implement a plan to facilitate personal growth and skill development related to web and multimedia design career opportunities.
- 66.05 Present an electronic career portfolio to an audience.
- 66.06 Update an electronic resume.
- 66.07 Conduct a comprehensive job search.
- 66.08 Develop a postsecondary education plan to prepare for an information technology career.

67.0 Participate in work-based learning experiences. – The student will be able to:

- 67.01 Participate in work-based learning experiences in a multimedia information technology environment.
- 67.02 Discuss the application of multimedia design principles in an information technology environment.

67.03 Discuss the use of multimedia design technology in an information technology environment.

68.0 Demonstrate proficiency in page design applicable to the WWW. – The student will be able to:

68.01 Identify and convert graphic formats.
68.02 Demonstrate proficiency in adding Java scripts to web pages.

69.0 Demonstrate knowledge of presentation production issues. – The student will be able to:

69.01 Demonstrate knowledge of copyright laws including copyright statute, disclaimers, and filing procedure.
69.02 Demonstrate an understanding of graphic and other file formats (e.g., EPS, TIFF, JPEG, ASCII, MPEG, MIDI, AVI, WAV, etc.) and knowledge of image size when scanning and saving files for use in different presentation types (Web, computer, print, etc.).
69.03 Demonstrate knowledge of presentation vocabulary/terms.
69.04 Compare and contrast and utilize various audio/video output solutions and devices (e.g., DVD, CD-Rom, web).

70.0 Demonstrate proficiency in using presentation software and equipment. – The student will be able to:

70.01 Produce a presentation that includes music, animation, and digital photography and present it using a projection system.
70.02 Using presentation software, create a multimedia presentation that incorporates shot and edited video, animation, music, narration and adheres to good design principles, use of transitions, and effective message conveyance.
70.03 Demonstrate knowledge of the roles and responsibilities of a multimedia production team (e.g. project manager, creative or design director, content experts, writers, graphic designers, animators, sound designers, videographer, interface designers/ programmers, etc.)
70.04 Collaborate with team members to plan, edit, evaluate, and present a multimedia presentation where individuals on the team function in specific production roles that were outlined in mastery of 201.03.
70.05 Create a self-running presentation with synchronized audio, convert presentation slides (e.g., PowerPoint) into streaming ASF files for use on the Web.
70.06 Create and edit an animation that includes text, symbols, layers, buttons, and tweened animation.
70.07 Construct web pages with streaming media content.

71.0 Demonstrate proficiency using video editing software and equipment. – The student will be able to:

71.01 Demonstrate knowledge of video and sound editing vocabulary, terms, and acronyms.
71.02 Demonstrate knowledge of non-linear editing software (NLEs) and compare the strengths and weaknesses of these programs.
71.03 Identify components of non-linear video editing equipment.
71.04 Set-up non-linear video editing equipment.

71.05 Compare offline to “real time” video editing.
71.06 Use storyboarding to plan a short nonlinear video project that includes existing video footage with a title, transitions, background sound, voice-over, animation, and rolling credits.
71.07 Create and edit a movie using video editing software that includes existing video footage with a title, transitions, background sound, voice-over, and rolling credits and output to video.
71.08 Collaborate with team members to plan, edit, and shoot video footage utilizing advanced video editing techniques and output to video.
71.09 Compare and contrast single track vs. multi-track audio/video editors.
71.10 Compose and edit sound tracks.

72.0 Demonstrate proficiency in web page design applicable to the WWW. – The student will be able to:

72.01 Determine the objectives and the audience for Web pages.
72.02 Identify design strategies to reach and keep an audience.
72.03 Use storyboarding to plan a Web site.
72.04 Create styles and other design elements (e.g. backgrounds, colors, fonts, buttons, etc.).

73.0 Demonstrate proficiency in using a WYSIWG editor, web design, or web animation software for web page design. – The student will be able to:

73.01 Apply style sheets for consistent Web site design.
73.02 Create and edit images and photographs for Web pages using digital imaging software (e.g., ImageReady in Photoshop).
73.03 Insert audio files into a Web page.
73.04 Create, edit and integrate video files into a Web page.
73.05 Create, edit and integrate animation files into a Web page.
73.06 Demonstrate an understanding of photograph compression factors such as transmission speed, color reduction, and browser support.
73.07 Build, optimize, edit, and test web pages for publication.
73.08 Create a web page that utilizes plug-ins.
73.09 Demonstrate an understanding of network and web implementation issues (e.g., bandwidth, compression, streaming).
73.10 Compare and contrast various methods by which information may be accessed on the Internet/Intranet (e.g., FTP, telnet, browser).
73.11 Demonstrate an understanding of file encryption methods (e.g., secure server, unsecured server).

74.0 Demonstrate proficiency in using digital photography and digital imaging. – The student will be able to:

74.01 Demonstrate knowledge of ethics related to digital imaging and legal and consent issues.
74.02 Apply effective design principles in digital photography compositions.
74.03 Demonstrate skill in using digital imaging software for image manipulation, color correction, and special effects to creatively convey a message or literary interpretation.

74.04 Compare and contrast still raster and still vector graphics.

75.0 Perform decision-making activities in a multimedia environment. – The student will be able to:

75.01 Determine work priorities, the audience, project budgets, project specifications, and the production schedule.
75.02 Evaluate and select appropriate software packages and multimedia tools to complete assigned tasks.
75.03 Present and defend design projects.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Introduction to Information Technology**
Course Number: **8207310**
Course Credit: **1**

Course Description:

This course is designed to provide an introduction to information technology concepts and careers as well as the impact information technology has on the world, people, and industry and basic web design concepts. The content includes information technology career research; operating systems and software applications; electronic communications including e-mail and Internet services; basic HTML, DHTML, and XML web commands and design; emerging technologies, and Web page design. If taken as part of the Information Technology program (8207300), after successful completion of this course, students will have met Occupational Completion Point A, Information Technology Assistant, SOC Code 15-1041.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance. – The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).

07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. – The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace. – The student will be able to:

10.01 Accept constructive criticism.
10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences. – The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities. – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.

12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.
12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems. – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW. – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using html commands. – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.

15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the WWW. – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software. – The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry. – The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers. – The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages. – The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.

20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies. – The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model. – The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications. – The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications. – The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **PC Support Services**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	8207340	B070400
CIP Number	0507.030502	0507.030502
Grade Level	9-12, 30, 31	30, 31
Standard Length	6 credits	900 hours
Teacher Certification	BUS ED 1 @2 VOE @7 TEACH CBE @7 BUS DP @7 G ELECT DP @7 G BOOKKEEPIN @4 7 G CLERICAL @7 G SECRETAR @7 G TEC ELEC $7 G COMPU SCI 6 ACCTING @7 MANAG SUPV @7	BUS ED 1 @2 VOE @7 TEACH CBE @7 BUS DP @7 G ELECT DP @7 G BOOKKEEPIN @4 7 G CLERICAL @7 G SECRETAR @7 G TEC ELEC $7 G COMPU SCI 6 ACCTING @7 MANAG SUPV @7
CTSO	FBLA BPA	Phi Beta Lambda BPA
SOC Codes (all applicable)	15-1041	15-1041
Facility Code	[212] http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	Mathematics: 9.0 Language: 9.0 Reading: 9.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as a Help Desk Support Assistant, Help Desk Specialist (Help Desk Technician), and Help Desk Analyst in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster. This program offers a broad foundation of knowledge and skills to prepare students for employment in network support services positions.

The content includes but is not limited to software applications and operating systems including the use of advanced software/system features and programs; electronic communication via the Internet; Web page components; computer networking and network administration; the interrelationships among major components of networks; hardware and software selection and installation; integration techniques to enhance projects; and preventative hardware maintenance.

Program Structure

This program is a planned sequence of instruction consisting of the Business Technology Education Core and three additional occupational completion points. Secondary or postsecondary students who have previously completed the Business Technology Education Core will not have to repeat the core. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or exit as an occupational completer.

When offered at the post secondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	OTA0040	Information Technology Assistant	150	15-1041
B	CTS0086	Help Desk Support Assistant	300	15-1041
C	CTS0087	Help Desk Technician	300	15-1041
D	CTS0088	Help Desk Analyst	150	15-1041

** Note: OTA0040 is a core program.*

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8200320	Keyboarding and Business Skills	.5 credit	15-1061	2
		AND			
	8200330	Computer and Business Skills	.5 credit		2

OCP	Course Number	Course Title	Length	SOC Code	Level
		OR			
	8209020	Computing for College and Careers	1 credit		2
		OR			
	8207310	Introduction to Information Technology	1 credit		2
B	8207210 8207220	PC Support 1 PC Support 2	1 credit 1 credit	15-1041	2 3
C	8207230 8207240	PC Support 3 PC Support 4	1 credit 1 credit	15-1041	3 3
D	8207250	PC Support 5	1 credit	15-1041	3

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills for secondary students. For postsecondary students, Phi Beta Lambda and BPA are the appropriate student organizations. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 9.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List

document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of

the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

The PSAV component of this program (B070400) has four statewide articulation agreement approved by the Articulation Coordinating Committee:

1. Computer Information Technology AS/AAS (0507030600/1507030600) – 9 credits
2. Computer Engineering Technology AS/AAS (0615040200/1615040200) – 6 credits
3. Networking Services Technology AS/AAS (0507030401/1507030401) – 6 credits
4. Office Administration AS/AAS (0507060300/1507060300) – 6 credits

For details on articulation agreements which correlate to programs and industry certifications refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

After successfully completing this program, the student will be able to perform the following:

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.

07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning though job shadowing, mentoring, e-coaching, etc.
08.0 Demonstrate personal and interpersonal skills appropriate for the workplace.
09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use Technology to apply and enhance communications skills in technical reading, writing.
04.0 Practice quality performance in the learning environment and the workplace.
05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
09.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
11.0 Perform e-mail activities.
12.0 Demonstrate operating systems.
13.0 Develop an awareness of emerging technologies.

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance and enhance personal performance in relation to the workplace. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal and professional ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
10.0 Demonstrate personal and interpersonal skills and attributes appropriate for the workplace.
11.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
12.0 Perform e-mail activities.
13.0 Demonstrate operating systems.
14.0 Develop an awareness of emerging technologies.

OR

Introduction to IT Competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.
02.0 Demonstrate Comprehension and communication skills.
03.0 Use technology to enhance the effectiveness of communication skills.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.
10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
11.0 Participate in work-based learning experiences.
12.0 Perform e-mail activities.
13.0 Demonstrate knowledge of different operating systems.
14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW.
15.0 Demonstrate proficiency using HTML commands.
16.0 Demonstrate proficiency in page design applicable to the WWW.
17.0 Demonstrate proficiency using specialized web design software.
18.0 Develop an awareness of the information technology industry.

19.0 Develop an awareness of microprocessors and digital computers.
20.0 Develop an awareness of programming languages.
21.0 Develop an awareness of emerging technologies.
22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model.
23.0 Demonstrate proficiency using common software applications.
24.0 Demonstrate proficiency using specialized software applications.

Program Standards

25.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing.
26.0 Participate in work-based learning experiences.
27.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, remote access, or direct contact.
28.0 Perform installation and configuration activities.
29.0 Identify the purpose of and interrelationships among major hardware components.
30.0 Perform e-mail activities.
31.0 Demonstrate an understanding of computer networks.
32.0 Develop electronic communications skills.
33.0 Demonstrate an understanding of system software and application software.
34.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing.
35.0 Participate in work-based learning experiences.
36.0 Perform installation and configuration activities.
37.0 Identify the purpose of and interrelationships among major hardware components.
38.0 Demonstrate proficiency using computer networks.
39.0 Develop electronic communications skills.
40.0 Demonstrate proficiency using system software and application software.
41.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing.
42.0 Participate in work-based learning experiences.
43.0 Perform installation and configuration activities.
44.0 Demonstrate proficiency using computer networks.
45.0 Demonstrate proficiency using system software and application software.
46.0 Develop telephone skills and techniques relevant to customer care services.
47.0 Demonstrate language arts knowledge and skills.
48.0 Demonstrate mathematics knowledge and skills.
49.0 Demonstrate science knowledge and skills.
50.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
51.0 Solve problems using critical thinking skills, creativity and innovation.
52.0 Use information technology tools.
53.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
54.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
55.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
56.0 Describe the importance of professional ethics and legal responsibilities.

57.0 Explain the importance of employability skill and entrepreneurship skills.
58.0 Demonstrate personal money-management concepts, procedures, and strategies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **PC Support Services**
PSAV Number: **B070400**

Course Number: OTA0040
Occupational Completion Point – A
Information Technology Assistant – 150 Hours – SOC Code 15-1041

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Demonstrate basic file management skills.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 03.01 Select and use word processing software and accompanying features to enhance written business communications.
- 03.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.
- 03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

07.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
07.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
07.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
07.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

08.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

08.01 Accept constructive criticism.
08.02 Apply appropriate strategies to manage and resolve conflict in work situations.
08.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

09.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
09.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic file management skills.
01.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

02.01 Take notes, organize, summarize, and paraphrase ideas and details.
02.02 Accurately follow written and oral instructions.
02.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
03.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

04.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
04.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

05.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
05.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
05.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
06.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
06.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

07.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
07.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

07.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

08.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
08.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
08.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
08.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
08.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
08.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
08.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
08.08 Build mentor relationships with local professionals in the industry.

09.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

09.01 Accept constructive criticism.
09.02 Apply appropriate strategies to manage and resolve conflict in work situations.
09.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

10.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

11.0 Perform e-mail activities. – The student will be able to:

11.01 Describe e-mail capabilities and functions.
11.02 Use the Internet to perform e-mail activities.

12.0 Demonstrate operating systems. – The student will be able to:

12.01 Identify operating system file naming conventions.

12.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
12.03 Demonstrate a working knowledge of standard file formats.
12.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

13.0 Develop an awareness of emerging technologies. – The student will be able to:

13.01 Compare and contrast various methods of evaluation for emerging technologies.
13.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
13.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance-The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic computer file management skills.
01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills-The student will be able to:

02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
02.02 Write clear and well-organized research papers, integrating a variety of information.
02.03 Prepare and deliver an oral report with appropriate materials to the class
02.04 Participate in large group discussions as a member and/or a leader.
02.05 Take notes, organize, summarize, and paraphrase ideas and details.
02.06 Accurately follow written and oral instructions.
02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills-The student will be able to:

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles-The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace-The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance-The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance-The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals-The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals-The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up).
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace-The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance-The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities–The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems–The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies-The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Introduction to Information Technology competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance — The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills — The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

- 03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
- 03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles — The student will be able to:

- 04.01 Explore, design, implement, and evaluate organizational structures and cultures.
- 04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
- 04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace — The student will be able to:

- 05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
- 05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance — The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance — The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals — The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals — The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace — The student will be able to:

10.01 Accept constructive criticism.
10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences — The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.
12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.
12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).

14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using HTML commands – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the WWW – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software - The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry - The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers - The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages - The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies - The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model - The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications - The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications - The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

Course Number: CTS0086
Occupational Completion Point – B
Help Desk Support Assistant – 300 Hours – SOC Code 15-1041

25.0 Use technology to apply communication skills in technical reading, writing, speaking, listening, and viewing - The student will be able to:

25.01 Communicate in a multicultural setting (e.g., with people from varying international, cultural, ethnic, and racial backgrounds).
25.02 Communicate technical information in a concise, understandable manner to a non-technical audience both verbally and in writing.
25.03 Contribute technical solutions to a resource library.
25.04 Demonstrate active listening techniques.

26.0 Participate in work-based learning experiences - The student will be able to:

26.01 Participate in work-based learning experiences in a PC/software support services environment.
26.02 Discuss the use of technology in a PC/software support services environment.
26.03 Compare and contrast the software applications used in a PC/software support services environment.

27.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, remote access, or direct contact - The student will be able to:

27.01 Apply appropriate communication etiquette in responding to user requests for assistance in a timely manner.
27.02 Demonstrate patience, active listening skills, and probing skills in responding to user requests for assistance.

28.0 Perform installation and configuration activities - The student will be able to:

28.01 Interpret error messages properly.
28.02 Install operating system software.

28.03 Customize operating systems.
28.04 Install application software.

29.0 Identify the purpose of and interrelationships among major hardware components - The student will be able to:

29.01 Demonstrate an understanding of the operation and purpose of hardware components.
29.02 Demonstrate proficiency in basic preventative hardware maintenance.
29.03 Apply basic rules for hardware safety.

30.0 Perform e-mail activities - The student will be able to:

30.01 Describe e-mail capabilities and functions.
30.02 Create and send e-mail messages with attachments.
30.03 Reply to and forward e-mail messages.
30.04 Organize and manage e-mail messages.
30.05 Utilize all applicable e-mail options and functions.
30.06 Use the Internet to perform e-mail activities.

31.0 Demonstrate an understanding of computer networks - The student will be able to:

31.01 Define networking and describe the purpose of a network.
31.02 Describe the various types of network topologies.

32.0 Develop electronic communications skills - The student will be able to:

32.01 Explain the operation of the Internet, its importance today, and its brief history.
32.02 Identify the types of electronic communications software and hardware and explain their functions and use.
32.03 Exhibit proficiency in using various features of a browser.
32.04 Demonstrate ethical use of the Internet.

33.0 Demonstrate an understanding of system software and application software - The student will be able to:

33.01 Perform word processing, spreadsheet, database, presentation, desktop publishing, and accounting activities with software commonly used in business.
33.02 Identify software problems to execute appropriate course of action.
33.03 Diagnose software problems to execute appropriate course of action.
33.04 Perform system backup.

47.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

47.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
47.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
47.03 Present information formally and informally for specific purposes and audiences. AF2.9

48.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

48.01 Demonstrate knowledge of arithmetic operations. AF3.2
48.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
48.03 Construct charts/tables/graphs using functions and data. AF3.5

49.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

49.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
49.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

50.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

50.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
50.02 Locate, organize and reference written information from various sources. CM 3.0
50.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
50.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
50.05 Apply active listening skills to obtain and clarify information. CM 7.0
50.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
50.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

51.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

51.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
51.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
51.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
51.04 Conduct technical research to gather information necessary for decision-making. PS 4.0

52.0 Use information technology tools. – The student will be able to:

52.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
52.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
52.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
52.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

53.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

53.01 Describe the nature and types of business organizations. SY 1.0

53.02 Explain the effect of key organizational systems on performance and quality.
53.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
53.04 Explain the impact of the global economy on business organizations.

56.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

56.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
56.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
56.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
56.04 Interpret and explain written organizational policies and procedures. ELR 2.0

Course Number: CTS0087
Occupational Completion Point – C
Help Desk Technician – 300 Hours – SOC Code 15-1041

34.0 Use technology to apply communication skills in technical reading, writing, speaking, listening, and viewing - The student will be able to:

34.01 Contribute technical solutions to a resource library.
34.02 Collaborate with associates to resolve user technical difficulties.
34.03 Use appropriate etiquette and manners when communicating with people of varying cultures.

35.0 Participate in work-based learning experiences - The student will be able to:

35.01 Participate in work-based learning experiences in a PC/software support services environment.
35.02 Compare and contrast the software applications used in a PC/software support services environment.
35.03 Discuss the management/supervisory skills needed in a PC/software support services environment.

36.0 Perform installation and configuration activities - The student will be able to:

36.01 Install and configure software including device drivers.
36.02 Resolve computer error messages.

37.0 Identify the purpose of and interrelationships among major hardware components - The student will be able to:

37.01 Demonstrate an understanding of the operation and purpose of hardware components.
37.02 Demonstrate preventative hardware maintenance.

38.0 Demonstrate proficiency using computer networks - The student will be able to:

38.01 Identify the purposes and interrelationships among the major components of networks (e.g., servers, clients, transmission media, network operating system, network boards).
38.02 Identify and describe the purpose of standards, protocols, and the Open Systems Interconnection (OSI) reference model.
38.03 Discuss the responsibilities of the network administrator (e.g., rights and responsibilities).

39.0 Develop electronic communications skills - The student will be able to:

39.01 Select and use appropriate electronic communications software and hardware for specific tasks.
39.02 Compare and contrast Internet software and protocols.
39.03 Diagnose and resolve electronic communications operational problems.
39.04 Identify the components of a Web page.

40.0 Demonstrate proficiency using system software and application software - The student will be able to:

40.01 Identify software problems to execute appropriate course of action
40.02 Perform advanced word processing, spreadsheet, database, presentation, desktop publishing, and accounting activities with software commonly used in business.
40.03 Refine and resolve software performance issues using advanced software/system features and programs.
40.04 Apply integration techniques to enhance business software application projects.
40.05 Describe knowledge database search procedures used to identify possible solutions when troubleshooting software and hardware problems.

54.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

54.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
54.02 Explain emergency procedures to follow in response to workplace accidents.
54.03 Create a disaster and/or emergency response plan. SHE 2.0

55.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

55.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
55.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
55.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
55.04 Employ mentoring skills to inspire and teach others. LT 5.0

57.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

57.01	Identify and demonstrate positive work behaviors needed to be employable.	ECD 1.0
57.02	Develop personal career plan that includes goals, objectives, and strategies.	ECD 2.0
57.03	Examine licensing, certification, and industry credentialing requirements.	ECD 3.0
57.04	Maintain a career portfolio to document knowledge, skills, and experience.	ECD 5.0
57.05	Evaluate and compare employment opportunities that match career goals.	ECD 6.0
57.06	Identify and exhibit traits for retaining employment.	ECD 7.0
57.07	Identify opportunities and research requirements for career advancement.	ECD 8.0
57.08	Research the benefits of ongoing professional development.	ECD 9.0
57.09	Examine and describe entrepreneurship opportunities as a career planning option.	ECD 10.0

58.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

58.01	Identify and describe the services and legal responsibilities of financial institutions.	FL 2.0
58.02	Describe the effect of money management on personal and career goals.	FL 3.0
58.03	Develop a personal budget and financial goals.	FL3.1
58.04	Complete financial instruments for making deposits and withdrawals.	FL3.2
58.05	Maintain financial records.	FL3.3
58.06	Read and reconcile financial statements.	FL3.4
58.07	Research, compare and contrast investment opportunities.	

Course Number: CTS0088
Occupational Completion Point – D
Help Desk Analyst – 150 Hours – SOC Code 15-1041

41.0 Use technology to apply communication skills in technical reading, writing, speaking, listening, and viewing - The student will be able to:

41.01 Determine when more information is needed and ask appropriate questions.

42.0 Participate in work-based learning experiences - The student will be able to:

42.01 Participate in work-based learning experiences in a PC/software support services environment.

43.0 Perform installation and configuration activities - The student will be able to:

43.01 Perform procedures for installing and replacing hardware.

44.0 Demonstrate proficiency using computer networks - The student will be able to:

44.01 Identify the purposes and interrelationships among the major components of networks (e.g., servers, clients, transmission media, network operating system, network boards).

45.0 Demonstrate proficiency using system software and application software— The student will be able to:

45.01 Describe knowledge database search procedures used to identify possible solutions when troubleshooting software and hardware problems.

46.0 Develop telephone skills and techniques relevant to customer care services - The student will be able to:

46.01 Apply call center vocabulary.
46.02 Listen and input information simultaneously.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Keyboarding and Business Skills**
Course Number: **8200320**
Course Credit: **.5**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental word processing applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society.

This course, along with Computer and Business Skills is equivalent to Computing for College and Careers. Students should complete this course before enrolling in Computer and Business Skills.

10.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 10.01 Develop keyboarding skills to enter and manipulate text and data.
- 10.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 10.03 Demonstrate basic file management skills.

11.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 11.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 11.02 Write clear and well-organized research papers, integrating a variety of information.
- 11.03 Prepare and deliver an oral report with appropriate materials to the class
- 11.04 Participate in large group discussions as a member and/or a leader.
- 11.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 11.06 Accurately follow written and oral instructions.
- 11.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

12.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 12.01 Select and use word processing software and accompanying features to enhance written business communications.
- 12.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.

12.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

13.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

13.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
13.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
13.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

14.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

14.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
14.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

15.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

15.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
15.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
15.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

16.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

16.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
16.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.

16.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
16.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

17.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

17.01 Accept constructive criticism.
17.02 Apply appropriate strategies to manage and resolve conflict in work situations.
17.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

18.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
18.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer and Business Skills**
Course Number: **8200330**
Course Credit: **.5**

Course Description:

This course is designed to introduce students to the basic skills and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

This course, along with Keyboarding and Business Skills is equivalent to Computing for College and Careers. Students should complete Keyboarding and Business Skills before enrolling in this course.

14.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 14.01 Develop keyboarding skills to enter and manipulate text and data.
- 14.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 14.03 Identify and describe communications and networking systems used in workplace environments.
- 14.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 14.05 Demonstrate basic file management skills.
- 14.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
- 14.07 Describe ethical issues and problems associated with computers and information systems.
- 14.08 Apply ergonomic principles applicable to the configuration of computer workstations.

15.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

- 15.01 Take notes, organize, summarize, and paraphrase ideas and details.
- 15.02 Accurately follow written and oral instructions.
- 15.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

16.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

16.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
16.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
16.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

17.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

17.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
17.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

18.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
18.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
18.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

19.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

19.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
19.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
19.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

20.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

20.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
20.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

20.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

21.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

21.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
21.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
21.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
21.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
21.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
21.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
21.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
21.08 Build mentor relationships with local professionals in the industry.

22.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

22.01 Accept constructive criticism.
22.02 Apply appropriate strategies to manage and resolve conflict in work situations.
22.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

23.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

23.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

24.0 Perform e-mail activities. – The student will be able to:

24.01 Describe e-mail capabilities and functions.
24.02 Use the Internet to perform e-mail activities.

25.0 Demonstrate operating systems. – The student will be able to:

25.01 Identify operating system file naming conventions.

25.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
25.03 Demonstrate a working knowledge of standard file formats.
25.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

26.0 Develop an awareness of emerging technologies. – The student will be able to:

26.01 Compare and contrast various methods of evaluation for emerging technologies.
26.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
26.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computing for College and Careers**
Course Number: **8209020**
Course Credit: **1**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society. This also includes proficiency with computers using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance-The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Demonstrate basic computer file management skills.
- 01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.07 Describe ethical issues and problems associated with computers and information systems.
- 01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills-The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills-The student will be able to:

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles-The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace-The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance-The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance-The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals-The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals-The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up). (LA.C.3.4.4)
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace-The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance-The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities–The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems–The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies-The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Introduction to Information Technology**
Course Number: **8207310**
Course Credit: **1**

Course Description:

This course is designed to provide an introduction to information technology concepts and careers as well as the impact information technology has on the world, people, and industry and basic web design concepts. The content includes information technology career research; operating systems and software applications; electronic communications including e-mail and Internet services; basic HTML, DHTML, and XML web commands and design; and emerging technologies and web page design.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance — The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills — The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles — The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace — The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance — The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance — The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals — The student will be able to:

- 08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals — The student will be able to:

- 09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
- 09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
- 09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
- 09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
- 09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace — The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences — The student will be able to:

- 11.01 Participate in work-based learning experiences in an information technology environment.
- 11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities – The student will be able to:

- 12.01 Describe e-mail capabilities and functions.
- 12.02 Identify components of an e-mail message.
- 12.03 Identify the components of an e-mail address.
- 12.04 Identify when to use different e-mail options.
- 12.05 Attach a file to an e-mail message.
- 12.06 Forward an e-mail message.

12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the www – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using html commands – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the www – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software - The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry - The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.
18.04

19.0 Develop an awareness of microprocessors and digital computers - The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages - The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies - The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the open systems interface (osi) model - The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications - The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications - The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **PC Support 1**
Course Number: **8207210**
Course Credit: **1**

Course Description:

This course is designed to develop entry-level skills for PC support services. Emphasis is placed on developing an understanding of various computer software applications and computer hardware.

25.0 Use technology to apply communication skills in technical reading, writing, speaking, listening, and viewing - The student will be able to:

25.01 Communicate in a multicultural setting (e.g., with people from varying international, cultural, ethnic, and racial backgrounds).

26.0 Participate in work-based learning experiences - The student will be able to:

26.01 Participate in work-based learning experiences in a PC/software support services environment.
26.02 Discuss the use of technology in a PC/software support services environment.

27.0 Perform installation and configuration activities - The student will be able to:

27.01 Install operating system software.

28.0 Identify the purpose of and interrelationships among major hardware components - The student will be able to:

28.01 Demonstrate an understanding of the operation and purpose of hardware components.
28.02 Demonstrate proficiency in basic preventative hardware maintenance.
28.03 Apply basic rules for hardware safety.

29.0 Develop electronic communications skills - The student will be able to:

29.01 Explain the operation of the Internet, its importance today, and its brief history.
29.02 Identify the types of electronic communications software and hardware and explain their functions and use.
29.03 Exhibit proficiency in using various features of a browser.

30.0 Demonstrate an understanding of system software and application software - The student will be able to:

30.01 Perform word processing, spreadsheet, database, presentation, desktop publishing, and accounting activities with software commonly used in business.
30.02 Identify software problems to execute appropriate course of action.

47.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

- 47.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
- 47.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
- 47.03 Present information formally and informally for specific purposes and audiences. AF2.9

48.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

- 48.01 Demonstrate knowledge of arithmetic operations. AF3.2
- 48.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
- 48.03 Construct charts/tables/graphs using functions and data. AF3.5

49.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

- 49.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
- 49.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **PC Support 2**
Course Number: **8207220**
Course Credit: **1**

Course Description:

This course continues the development of basic entry-level skills for PC support services. The content includes software applications and operating systems, electronic communication via the Internet, and an introduction to computer networking.

25.0 Use technology to apply communication skills in technical reading, writing, speaking, listening, and viewing - The student will be able to:

- 25.01 Communicate in a multicultural setting (e.g., with people from varying international, cultural, ethnic, and racial backgrounds).
- 25.02 Communicate technical information in a concise, understandable manner to a non-technical audience both verbally and in writing.
- 25.03 Contribute technical solutions to a resource library.
- 25.04 Demonstrate active listening techniques.

26.0 Participate in work-based learning experiences - The student will be able to:

- 26.01 Participate in work-based learning experiences in a PC/software support services environment.
- 26.02 Discuss the use of technology in a PC/software support services environment.
- 26.03 Compare and contrast the software applications used in a PC/software support services environment.

27.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, remote access, or direct contact - The student will be able to:

- 27.01 Apply appropriate communication etiquette in responding to user requests for assistance in a timely manner.
- 27.02 Demonstrate patience, active listening skills, and probing skills in responding to user requests for assistance.

28.0 Perform installation and configuration activities - The student will be able to:

- 28.01 Interpret error messages properly.
- 28.02 Install operating system software.
- 28.03 Customize operating systems.
- 28.04 Install application software.

29.0 Identify the purpose of and interrelationships among major hardware components - The student will be able to:

29.01 Demonstrate an understanding of the operation and purpose of hardware components.
29.02 Demonstrate proficiency in basic preventative hardware maintenance.
29.03 Apply basic rules for hardware safety.

30.0 Perform e-mail activities - The student will be able to:

30.01 Describe e-mail capabilities and functions.
30.02 Create and send e-mail messages with attachments.
30.03 Reply to and forward e-mail messages.
30.04 Organize and manage e-mail messages.
30.05 Utilize all applicable e-mail options and functions.
30.06 Use the Internet to perform e-mail activities.

31.0 Demonstrate an understanding of computer networks - The student will be able to:

31.01 Define networking and describe the purpose of a network.
31.02 Describe the various types of network topologies.

32.0 Develop electronic communications skills - The student will be able to:

32.01 Demonstrate ethical use of the Internet.

33.0 Demonstrate an understanding of system software and application software - The student will be able to:

33.01 Diagnose software problems to execute appropriate course of action.
33.02 Perform system backup.

50.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

50.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
50.02 Locate, organize and reference written information from various sources. CM 3.0
50.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
50.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
50.05 Apply active listening skills to obtain and clarify information. CM 7.0
50.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
50.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

51.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

51.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
51.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
51.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0

51.04 Conduct technical research to gather information necessary for decision-making. PS 4.0

52.0 Use information technology tools. – The student will be able to:

52.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
52.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
52.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
52.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

53.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

53.01 Describe the nature and types of business organizations. SY 1.0
53.02 Explain the effect of key organizational systems on performance and quality.
53.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
53.04 Explain the impact of the global economy on business organizations.

56.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

56.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
56.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
56.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
56.04 Interpret and explain written organizational policies and procedures. ELR 2.0

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **PC Support 3**
Course Number: **8207230**
Course Credit: **1**

Course Description:

This course continues the study of PC support services and is designed to develop advanced skills for employment. The content includes advanced software applications, the interrelationships among major components of networks, hardware installation, and selection of electronic communications software and hardware.

34.0 Use technology to apply communication skills in technical reading, writing, speaking, listening, and viewing - The student will be able to:

- 34.01 Contribute technical solutions to a resource library.
- 34.02 Collaborate with associates to resolve user technical difficulties.
- 34.03 Use appropriate etiquette and manners when communicating with people of varying cultures.

35.0 Participate in work-based learning experiences - The student will be able to:

- 35.01 Participate in work-based learning experiences in a PC/software support services environment.
- 35.02 Compare and contrast the software applications used in a PC/software support services environment.

36.0 Perform installation and configuration activities - The student will be able to:

- 36.01 Install and configure software including device drivers.

37.0 Identify the purpose of and interrelationships among major hardware components - The student will be able to:

- 37.01 Demonstrate an understanding of the operation and purpose of hardware components.

38.0 Demonstrate proficiency using computer networks - The student will be able to:

- 38.01 Identify the purposes and interrelationships among the major components of networks (e.g., servers, clients, transmission media, network operating system, network boards).

39.0 Develop electronic communications skills - The student will be able to:

- 39.01 Select and use appropriate electronic communications software and hardware for specific tasks.

39.02 Compare and contrast Internet software and protocols.

40.0 Demonstrate proficiency using system software and application software - The student will be able to:

40.01 Identify software problems to execute appropriate course of action.
40.02 Perform advanced word processing, spreadsheet, database, presentation, desktop publishing, and accounting activities with software commonly used in business.

54.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

54.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
54.02 Explain emergency procedures to follow in response to workplace accidents.
54.03 Create a disaster and/or emergency response plan. SHE 2.0

55.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

55.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
55.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
55.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
55.04 Employ mentoring skills to inspire and teach others. LT 5.0

57.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

57.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
57.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
57.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
57.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
57.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
57.06 Identify and exhibit traits for retaining employment. ECD 7.0
57.07 Identify opportunities and research requirements for career advancement. ECD 8.0
57.08 Research the benefits of ongoing professional development. ECD 9.0
57.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

58.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

58.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
58.02 Describe the effect of money management on personal and career goals. FL 3.0
58.03 Develop a personal budget and financial goals. FL3.1
58.04 Complete financial instruments for making deposits and withdrawals. FL3.2
58.05 Maintain financial records. FL3.3

58.06 Read and reconcile financial statements. FL3.4
58.07 Research, compare and contrast investment opportunities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **PC Support 4**
Course Number: **8207240**
Course Credit: **1**

Course Description:

This course continues the development of advanced skills for entry –level employment in PC support services positions. The content includes utilization of advanced software/system features and programs, integration techniques to enhance projects, network administration, components of Web pages, and preventative hardware maintenance.

34.0 Use technology to apply communication skills in technical reading, writing, speaking, listening, and viewing - The student will be able to:

34.01 Collaborate with associates to resolve user technical difficulties.

35.0 Participate in work-based learning experiences - The student will be able to:

35.01 Participate in work-based learning experiences in a PC/software support services environment.
35.02 Discuss the management/supervisory skills needed in a PC/software support services environment.

36.0 Perform installation and configuration activities - The student will be able to:

36.01 Resolve computer error messages.

37.0 Identify the purpose of and interrelationships among major hardware components - The student will be able to:

37.01 Demonstrate preventative hardware maintenance.

38.0 Demonstrate proficiency using computer networks - The student will be able to:

38.01 Identify and describe the purpose of standards, protocols, and the Open Systems Interconnection (OSI) reference model.
38.02 Discuss the responsibilities of the network administrator (e.g., rights and responsibilities).

39.0 Develop electronic communications skills - The student will be able to:

39.01 Diagnose and resolve electronic communications operational problems.
39.02 Identify the components of a Web page.

40.0 Demonstrate proficiency using system software and application software - The student will be able to:

40.01 Refine and resolve software performance issues using advanced software/system features and programs.
40.02 Apply integration techniques to enhance business software application projects.
40.03 Describe knowledge database search procedures used to identify possible solutions when troubleshooting software and hardware problems.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **PC Support 5**
Course Number: **8207250**
Course Credit: **1**

Course Description:

This course continues the development of advanced skills for entry –level employment in PC support services positions. The content includes utilization of advanced software/system features and programs, integration techniques to enhance projects, network administration, components of Web pages, and preventative hardware maintenance.

41.0 Use technology to apply communication skills in technical reading, writing, speaking, listening, and viewing - The student will be able to:

41.01 Determine when more information is needed and ask appropriate questions.

42.0 Participate in work-based learning experiences - The student will be able to:

42.01 Participate in work-based learning experiences in a PC/software support services environment.

43.0 Perform installation and configuration activities - The student will be able to:

43.01 Perform procedures for installing and replacing hardware.

44.0 Demonstrate proficiency using computer networks - The student will be able to:

44.01 Identify the purposes and interrelationships among the major components of networks (e.g., servers, clients, transmission media, network operating system, network boards).

45.0 Demonstrate proficiency using system software and application software - The student will be able to:

45.01 Describe knowledge database search procedures used to identify possible solutions when troubleshooting software and hardware problems.

46.0 Develop telephone skills and techniques relevant to customer care services - The student will be able to:

46.01 Apply call center vocabulary.
46.02 Listen and input information simultaneously.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **New Media Technology**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	8207400	B077400
CIP Number	0510.010100	0510.010100
Grade Level	9-12, 30, 31	30, 31
Standard Length	4 credits	600 hours
Teacher Certification	BUS ED 1 @2 VOE @7 TEACH CBE @7 BUS DP @7 G ELECT DP @7 G CLERICAL @7 G SECRETAR @7 G STENOG @4 TEC ELEC @7 G COMPU SCI 6 WHOLESAL @7G COMM ART @7G TV PRO TEC @7G TEC ED 1@2 I ART-TEC 1@2 COMP SVC 7 G	BUS ED 1 @2 VOE @7 TEACH CBE @7 BUS DP @7 G ELECT DP @7 G CLERICAL @7 G SECRETAR @7 G STENOG @4 TEC ELEC @7 G COMPU SCI 6 WHOLESAL @7G COMM ART @7G TV PRO TEC @7G TEC ED 1@2 I ART-TEC 1@2 COMP SVC 7 G
CTSO	FBLA BPA	Phi Beta Lambda BPA
SOC Codes (all applicable)	15-1041; 27-1014	15-1041; 27-1014
Facility Code	[212] http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	Mathematics: 9.0 Language: 9.0 Reading: 9.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in digital media, new media, and multimedia positions in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to an overview of the skills needed for entry-level positions in these career fields through practical experiences in digital photography, Web page design, digital video editing, and presentation development. Specialized skills in multimedia presentations and production such as video editing, audio input, and simple animation are used to produce a variety of multimedia projects.

Program Structure

This program is a planned sequence of instruction consisting of the Business Technology Education Core and three additional occupational completion points. Secondary students who have previously completed the Business Technology Education Core will not have to repeat the core. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or exit as an occupational completer.

When offered at the post secondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	OTA0040*	Information Technology Assistant	150	15-1041
B	GRA0001	Presentation Specialist	150	27-1014
C	GRA0002	Presentation Graphic Artist	150	27-1014
D	GRA0003	Web Production/Design Assistant	150	27-1014

** Note: OTA0040 is a core program.*

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8200320	Keyboarding and Business Skills	.5 credit	15-1061	2
		AND			
	8200330	Computer and Business Skills	.5 credit		2
		OR			
	8209020	Computing for College and Careers	1 credit		2

OCP	Course Number	Course Title	Length	SOC Code	Level
		OR			
	8207310	Introduction to Information Technology	1 credit		2
B	8207410	New Media and Digital Imaging Fundamentals	1 credit	27-1014	2
C	8207420	Digital Video and Sound Fundamentals	1 credit	27-1014	2
D	8207110	Web Design 1	1 credit	27-1014	2

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills for secondary students. For postsecondary students, Phi Beta Lambda and BPA are the appropriate student organizations. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 9.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported

accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

The PSAV component of this program has no statewide articulation agreement approved by the Articulation Coordinating Committee. However, this does not preclude the awarding of credits by any college through local agreements.

For details on statewide articulation agreements which correlate to programs and industry certifications, refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

After successfully completing this program, the student will be able to perform the following:

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning though job shadowing, mentoring, e-coaching, etc.
08.0 Demonstrate personal and interpersonal skills appropriate for the workplace.
09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use Technology to apply and enhance communications skills in technical reading, writing.
04.0 Practice quality performance in the learning environment and the workplace.
05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
09.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
11.0 Perform e-mail activities.
12.0 Demonstrate operating systems.
13.0 Develop an awareness of emerging technologies.

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance and enhance personal performance in relation to the workplace. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal and professional ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
10.0 Demonstrate personal and interpersonal skills and attributes appropriate for the workplace.
11.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
12.0 Perform e-mail activities.
13.0 Demonstrate operating systems.
14.0 Develop an awareness of emerging technologies.

OR

Introduction to IT Competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.
02.0 Demonstrate Comprehension and communication skills.
03.0 Use technology to enhance the effectiveness of communication skills.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.
10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
11.0 Participate in work-based learning experiences.
12.0 Perform e-mail activities.
13.0 Demonstrate knowledge of different operating systems.
14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW.
15.0 Demonstrate proficiency using HTML commands.
16.0 Demonstrate proficiency in page design applicable to the WWW.
17.0 Demonstrate proficiency using specialized web design software.
18.0 Develop an awareness of the information technology industry.
19.0 Develop an awareness of microprocessors and digital computers.
20.0 Develop an awareness of programming languages.
21.0 Develop an awareness of emerging technologies.
22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model.
23.0 Demonstrate proficiency using common software applications.
24.0 Demonstrate proficiency using specialized software applications.

Program Standards

25.0 Demonstrate knowledge of presentation production issues.
26.0 Demonstrate proficiency in using presentation software and equipment.
27.0 Demonstrate proficiency in using a WYSIWG editor, web design, or web animation software for web page creation.
28.0 Demonstrate proficiency in using Digital Photography and Digital Imaging.
29.0 Demonstrate proficiency in using presentation software and equipment.
30.0 Demonstrate proficiency using video editing software and equipment.

31.0 Demonstrate language arts knowledge and skills.
32.0 Demonstrate mathematics knowledge and skills.
33.0 Demonstrate science knowledge and skills.
34.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
35.0 Solve problems using critical thinking skills, creativity and innovation.
36.0 Use information technology tools.
37.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
38.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
39.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
40.0 Describe the importance of professional ethics and legal responsibilities.
41.0 Explain the importance of employability skill and entrepreneurship skills.
42.0 Demonstrate personal money-management concepts, procedures, and strategies.

Web Design 1 Competencies

01.0 Participate in work-based learning experiences.
02.0 Perform e-mail activities.
03.0 Demonstrate proficiency using operating systems.
04.0 Perform decision making activities.
05.0 Demonstrate proficiency navigating the Internet, intranet, and the WWW.
06.0 Demonstrate proficiency using HTML commands.
07.0 Demonstrate proficiency in page design applicable to the WWW.
08.0 Develop an awareness of Internet/intranet tools.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **New Media Technology**
PSAV Number: **B077400**

Course Number: OTA0040
Occupational Completion Point – A
Multimedia Production Assistant – 150 Hours – SOC Code 15-1041

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Demonstrate basic file management skills.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 03.01 Select and use word processing software and accompanying features to enhance written business communications.
- 03.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.
- 03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

07.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
07.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
07.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
07.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

08.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

08.01 Accept constructive criticism.
08.02 Apply appropriate strategies to manage and resolve conflict in work situations.
08.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

09.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
09.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic file management skills.
01.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

02.01 Take notes, organize, summarize, and paraphrase ideas and details.
02.02 Accurately follow written and oral instructions.
02.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
03.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

04.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
04.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

05.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
05.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
05.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
06.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
06.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

07.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
07.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

07.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

08.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
08.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
08.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
08.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
08.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
08.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
08.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
08.08 Build mentor relationships with local professionals in the industry.

09.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

09.01 Accept constructive criticism.
09.02 Apply appropriate strategies to manage and resolve conflict in work situations.
09.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

10.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

11.0 Perform e-mail activities. – The student will be able to:

11.01 Describe e-mail capabilities and functions.
11.02 Use the Internet to perform e-mail activities.

12.0 Demonstrate operating systems. – The student will be able to:

12.01 Identify operating system file naming conventions.

12.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
12.03 Demonstrate a working knowledge of standard file formats.
12.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

13.0 Develop an awareness of emerging technologies. – The student will be able to:

13.01 Compare and contrast various methods of evaluation for emerging technologies.
13.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
13.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance-The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.)
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic computer file management skills.
01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills-The student will be able to:

02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
02.02 Write clear and well-organized research papers, integrating a variety of information.
02.03 Prepare and deliver an oral report with appropriate materials to the class
02.04 Participate in large group discussions as a member and/or a leader.
02.05 Take notes, organize, summarize, and paraphrase ideas and details.
02.06 Accurately follow written and oral instructions.
02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills-The student will be able to:

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles-The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace-The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance-The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance-The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals-The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals-The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up). (LA.C.3.4.4)
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace-The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance-The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities–The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems–The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies-The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Introduction to Information Technology competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance — The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills — The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

- 03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
- 03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles — The student will be able to:

- 04.01 Explore, design, implement, and evaluate organizational structures and cultures.
- 04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
- 04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace — The student will be able to:

- 05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
- 05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance — The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance — The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals — The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals — The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace — The student will be able to:

10.01 Accept constructive criticism.

10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences — The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.
12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.
12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the www – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).

14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using html commands – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the www – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software - The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry - The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers - The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages - The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies - The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the open systems interface (osi) model - The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications - The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail,

presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications - The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

Course Number: GRA0001
Occupational Completion Point – B
Presentation Specialist – 150 Hours – SOC Code 27-1014

25.0 Demonstrate knowledge of presentation production issues—The student will be able to:

25.01 Identify characteristics of various types of presentations informing, selling, teaching, entertaining).
25.02 Identify presentation materials (e.g.. handouts, seminar notebooks, business cards, coupons, etc.) and presentation marketing mediums (ex. print media such as newspaper, magazines; TV; movies; computer presentations; interactive CD ROM; kiosks, and Web pages, etc.).
25.03 Identify design characteristics (fonts, size and styles, backgrounds, etc.) that are suited for each type of presentation format and material.
25.04 Demonstrate knowledge of copyright laws including copyright statue, disclaimers, and filing procedures.
25.05 Research and identify skills needed for career positions in multimedia.
25.06 Demonstrate an understanding of graphic and other file formats (e.g., EPS, TIFF, JPEG, ASCII, MPEG, MIDI, AVI, WAV, etc.) and knowledge of image size when scanning and saving files for use in different presentation types (Web, computer, print, etc.).
25.07 Demonstrate knowledge of presentation vocabulary/terms.

26.0 Demonstrate proficiency in using presentation software and equipment - The student will be able to:

26.01 Produce a simple presentation that includes handouts and present it using a projection system.

27.0 Demonstrate proficiency in using a WYSIWG editor, web design, or web animation software for web page creation - The student will be able to:

27.01 Create and edit images, photographs for Web pages using digital imaging software (e.g. ImageReady in Photoshop).
27.02 Optimize images to make them “Web ready”.

27.03 Demonstrate knowledge of image formats related to photos and graphics on the Internet (e.g. Graphic formats (Tiff & EPS), Web formats (JEPG, GIF, PNG), etc.).
27.04 Demonstrate an understanding of photograph compression factors such as transmission speed, color reduction, and browser support.
27.05 Save and export a photograph to the Web in the format best for image quality and file size.

28.0 Demonstrate proficiency in using digital photography and digital imaging - The student will be able to:

28.01 Demonstrate knowledge of ethics related to digital imaging, and legal and consent issues.
28.02 Apply effective design principles in digital photography compositions.
28.03 Illustrate the essence of an event, quote, or slogan through digital photography/imaging.
28.04 Demonstrate skill in using digital imaging software for image manipulation, color correction, and special effects to creatively convey a message or literary interpretation.
28.05 Demonstrate skill in scanning and cropping photographs.
28.06 Incorporate scanned or digitally taken photographs into documents (poster, brochure, card, photo journalism story, report or book covers, letterhead, etc.) that have been designed using desktop publishing software or the desktop publishing features of word processing software.

31.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

31.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
31.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
31.03 Present information formally and informally for specific purposes and audiences. AF2.9

32.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

32.01 Demonstrate knowledge of arithmetic operations. AF3.2
32.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
32.03 Construct charts/tables/graphs using functions and data. AF3.5

33.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

33.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
33.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

Course Number: GRA0002
Occupational Completion Point – C
Presentation Graphic Artist – 150 Hours – SOC Code 27-1014

29.0 Demonstrate proficiency in using presentation software and equipment - The student will be able to:

29.01 Using presentation software, create a multimedia presentation that incorporates shot and edited video, animation, music, narration and adheres to good design principles, use of transitions, and effective message conveyance.
29.02 Demonstrate knowledge of the roles and responsibilities of a multimedia production team (e.g. project manager, creative or design director, content experts, writers, graphic designers, animators, sound designers, videographer, interface designers/programmers, etc.).
29.03 Collaborate with team members to plan, edit, evaluate, and present a multimedia presentation.

30.0 Demonstrate proficiency using video editing software and equipment—The student will be able to:

30.01 Demonstrate knowledge of video and sound editing vocabulary, terms, and acronyms.
30.02 Demonstrate knowledge of non-linear editing software (NLEs) and compare the strengths and weaknesses of these programs.
30.03 Identify components of non-linear video editing equipment.
30.04 Set-up non-linear video editing equipment.
30.05 Compare offline to “real time” video editing.
30.06 Use storyboarding to plan a short nonlinear video project that includes existing video footage with a title, transitions, background sound, voice-over, animation, and rolling credits.
30.07 Create and edit a movie using video editing software that includes existing video footage with a title, transitions, background sound, voice-over, and rolling credits and output to video.
30.08 Collaborate with team members to create a short movie utilizing good lighting and sound: plan, shoot, and edit video footage as a team.
30.09 Using a video editor, create animated GIFs.
30.10 Collaborate with team members to plan, edit, and shoot video footage utilizing advanced video editing techniques and output to video.
30.11 Discuss the use of batch processing and project trimming.
30.12 Plan, create, edit and present a short nonlinear QuickTime movie with title, transitions, sub and virtual clips, sound, background music, voice-over, and credits.

34.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

34.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
34.02 Locate, organize and reference written information from various sources. CM 3.0
34.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
34.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
34.05 Apply active listening skills to obtain and clarify information. CM 7.0

34.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
34.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

35.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

35.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
35.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
35.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
35.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

36.0 Use information technology tools. – The student will be able to:

36.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
36.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
36.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
36.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

37.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

37.01 Describe the nature and types of business organizations. SY 1.0
37.02 Explain the effect of key organizational systems on performance and quality.
37.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
37.04 Explain the impact of the global economy on business organizations.

40.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

40.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
40.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
40.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
40.04 Interpret and explain written organizational policies and procedures. ELR 2.0

Course Number: GRA0003
Occupational Completion Point – D
Web Production/Design Assistant – 150 Hours – SOC Code 27-1014

01.0 Participate in work-based learning experiences — The student will be able to:

01.01 Participate in work-based learning experiences in a Web Design environment.
01.02 Discuss the use of technology in a Web Design Services (Web Design) environment.
01.03 Compare and contrast the software applications used in a Web Design Services (Web Design) environment.

02.0 Perform e-mail activities — The student will be able to:

02.01 Describe e-mail capabilities and functions.
02.02 Create and send e-mail messages with attachments.
02.03 Reply to and forward e-mail messages.
02.04 Organize and manage e-mail messages.
02.05 Utilize all applicable e-mail options and functions.
02.06 Use the Internet to perform e-mail activities.
02.07 Define the standards used by Internet/Intranet e-mail (e.g., pop3, mime).
02.08 Describe the issues involved in sending and receiving documents as e-mail attachments.
02.09 Identify privacy issues in the employee/employer relationship (e.g., avoid libel, spam, personal usage).

03.0 Demonstrate proficiency using operating systems — The student will be able to:

03.01 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
03.02 Describe the difference between relative and absolute path commands.
03.03 Demonstrate a working knowledge of standard file formats.
03.04 Demonstrate proficiency with help references.

04.0 Perform decision making activities - The student will be able to:

04.01 Determine work priorities.
04.02 Evaluate and select appropriate software packages to complete assigned tasks.
04.03 Evaluate information to be used and choose relevant material.
04.04 Determine the audience.
04.05 Compare and select appropriate multimedia tools.

05.0 Demonstrate proficiency navigating the Internet, intranet, and the WWW — The student will be able to:

05.01 Identify and describe Web terminology.
05.02 Describe the history of the Internet and intranet.
05.03 Describe the difference between a client and a server.
05.04 Describe the difference between the Internet, intranet, and WWW.
05.05 Describe the different methods by which information may be accessed on the Internet/intranet (e.g., browser, FTP, gopher, telnet, veronica).
05.06 List the available resources and services on the Internet (e.g., electronic commerce, personal, government, business, etiquette, education, distance learning).
05.07 Locate information on the Internet/intranet using a Web browser.
05.08 Copy information from the Internet/intranet, save, and print using a Web browser.

05.09 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
05.10 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
05.11 Identify and use search engines to locate information.
05.12 Describe the various ways of communicating on the Internet/Intranet (e.g., e-mail, forums, IRC, CHAT, Listserv, Usenet, MOOs, etc.).
05.13 Describe and observe Internet/intranet ethics and copyright laws.
05.14 Identify methods to protect personal copyright.

06.0 Demonstrate proficiency using HTML commands — The student will be able to:

06.01 Identify elements of a Web page.
06.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
06.03 Define basic HTML terminology.
06.04 Analyze HTML source code developed by others.
06.05 Create a Web page using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
06.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
06.07 Add graphics to Web pages.
06.08 Edit and test HTML documents for accuracy and validity.
06.09 Use basic functions of HTML editors and converters.
06.10 Use basic functions of WYSIWYG editors.

07.0 Demonstrate proficiency in page design applicable to the WWW — The student will be able to:

07.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
07.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
07.03 Identify and convert graphic formats.
07.04 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD ROMS).
07.05 Use image design software to create and edit images.

08.0 Develop an awareness of Internet/intranet tools - The student will be able to:

08.01 Describe the various hardware components used on the Internet/Intranet.
08.02 Demonstrate the use of compression programs.
08.03 Demonstrate the use of backups.

38.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

38.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
38.02 Explain emergency procedures to follow in response to workplace accidents.

38.03 Create a disaster and/or emergency response plan. SHE 2.0

39.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

39.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
39.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
39.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
39.04 Employ mentoring skills to inspire and teach others. LT 5.0

41.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

41.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
41.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
41.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
41.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
41.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
41.06 Identify and exhibit traits for retaining employment. ECD 7.0
41.07 Identify opportunities and research requirements for career advancement. ECD 8.0
41.08 Research the benefits of ongoing professional development. ECD 9.0
41.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

42.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

42.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
42.02 Describe the effect of money management on personal and career goals. FL 3.0
42.03 Develop a personal budget and financial goals. FL3.1
42.04 Complete financial instruments for making deposits and withdrawals. FL3.2
42.05 Maintain financial records. FL3.3
42.06 Read and reconcile financial statements. FL3.4
42.07 Research, compare and contrast investment opportunities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Keyboarding and Business Skills**
Course Number: **8200320**
Course Credit: **.5**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental word processing applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society.

This course, along with Computer and Business Skills is equivalent to Computing for College and Careers. Students should complete this course before enrolling in Computer and Business Skills.

10.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 10.01 Develop keyboarding skills to enter and manipulate text and data.
- 10.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 10.03 Demonstrate basic file management skills.

11.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 11.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 11.02 Write clear and well-organized research papers, integrating a variety of information.
- 11.03 Prepare and deliver an oral report with appropriate materials to the class
- 11.04 Participate in large group discussions as a member and/or a leader.
- 11.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 11.06 Accurately follow written and oral instructions.
- 11.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

12.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 12.01 Select and use word processing software and accompanying features to enhance written business communications.
- 12.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.

12.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

13.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

13.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
13.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
13.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

14.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

14.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
14.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

15.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

15.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
15.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
15.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

16.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

16.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
16.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.

16.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
16.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

17.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

17.01 Accept constructive criticism.
17.02 Apply appropriate strategies to manage and resolve conflict in work situations.
17.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

18.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
18.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer and Business Skills**
Course Number: **8200330**
Course Credit: **.5**

Course Description:

This course is designed to introduce students to the basic skills and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

This course, along with Keyboarding and Business Skills is equivalent to Computing for College and Careers. Students should complete Keyboarding and Business Skills before enrolling in this course.

14.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 14.01 Develop keyboarding skills to enter and manipulate text and data.
- 14.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 14.03 Identify and describe communications and networking systems used in workplace environments.
- 14.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 14.05 Demonstrate basic file management skills.
- 14.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
- 14.07 Describe ethical issues and problems associated with computers and information systems.
- 14.08 Apply ergonomic principles applicable to the configuration of computer workstations.

15.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

- 15.01 Take notes, organize, summarize, and paraphrase ideas and details.
- 15.02 Accurately follow written and oral instructions.
- 15.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

16.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

16.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
16.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
16.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

17.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

17.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
17.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

18.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
18.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
18.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

19.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

19.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
19.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
19.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

20.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

20.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
20.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

20.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

21.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

21.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
21.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
21.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
21.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
21.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
21.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
21.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
21.08 Build mentor relationships with local professionals in the industry.

22.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

22.01 Accept constructive criticism.
22.02 Apply appropriate strategies to manage and resolve conflict in work situations.
22.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

23.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

23.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

24.0 Perform e-mail activities. – The student will be able to:

24.01 Describe e-mail capabilities and functions.
24.02 Use the Internet to perform e-mail activities.

25.0 Demonstrate operating systems. – The student will be able to:

25.01 Identify operating system file naming conventions.

25.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
25.03 Demonstrate a working knowledge of standard file formats.
25.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

26.0 Develop an awareness of emerging technologies. – The student will be able to:

26.01 Compare and contrast various methods of evaluation for emerging technologies.
26.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
26.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computing for College and Careers**
Course Number: **8209020**
Course Credit: **1**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society. This also includes proficiency with computers using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance-The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Demonstrate basic computer file management skills.
- 01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.07 Describe ethical issues and problems associated with computers and information systems.
- 01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills-The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills-The student will be able to:

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles-The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace-The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance-The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance-The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals-The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals-The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up). (LA.C.3.4.4)
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace-The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance-The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities–The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems–The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies-The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Introduction to Information Technology**
Course Number: **8207310**
Course Credit: **1**

Course Description:

This course is designed to provide an introduction to information technology concepts and careers as well as the impact information technology has on the world, people, and industry and basic web design concepts. The content includes information technology career research; operating systems and software applications; electronic communications including e-mail and Internet services; basic HTML, DHTML, and XML web commands and design; and emerging technologies and web page design.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance — The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills — The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles — The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace — The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance — The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance — The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals — The student will be able to:

- 08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals — The student will be able to:

- 09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
- 09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
- 09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
- 09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
- 09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace — The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences — The student will be able to:

- 11.01 Participate in work-based learning experiences in an information technology environment.
- 11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities – The student will be able to:

- 12.01 Describe e-mail capabilities and functions.
- 12.02 Identify components of an e-mail message.
- 12.03 Identify the components of an e-mail address.
- 12.04 Identify when to use different e-mail options.
- 12.05 Attach a file to an e-mail message.
- 12.06 Forward an e-mail message.

12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the www – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using html commands – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the www – The student will be able to:

- 16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
- 16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
- 16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
- 16.04 Use image design software to create and edit images.
- 16.05 Demonstrate proficiency in publishing to the Internet.
- 16.06 Demonstrate proficiency in adding downloadable forms to web pages.
- 16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software - The student will be able to:

- 17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
- 17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry - The student will be able to:

- 18.01 Explain how information technology impacts the operation and management of business and society.
- 18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
- 18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers - The student will be able to:

- 19.01 Describe the evolution of the digital computer.
- 19.02 Explain the general architecture of a microcomputer system.
- 19.03 Explain the evolution of microprocessors.
- 19.04 Explain software hierarchy and its impact on microprocessors.
- 19.05 Explain the need for and use of peripherals.
- 19.06 Demonstrate proficiency using peripherals.
- 19.07 Identify the basic concepts of computer maintenance and upgrades.
- 19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages - The student will be able to:

- 20.01 Explain the history of programming languages.
- 20.02 Explain the need for and use of compilers.
- 20.03 Explain how compilers work.
- 20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies - The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the open systems interface (osi) model - The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications - The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications - The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **New Media and Digital Imaging Fundamentals**
Course Number: **8207410**
Course Credit: **1**

Course Description:

This course provides an overview of presentation guidelines and design elements associated with various presentation types. Effective digital photography composition and digital imaging software features including optimizing digital photographs for Web publication are covered. Students will create an electronic slide presentation using presentation software.

25.0 Demonstrate knowledge of presentation production issues—The student will be able to:

- 25.01 Identify characteristics of various types of presentations informing, selling, teaching, entertaining).
- 25.02 Identify presentation materials (e.g.. handouts, seminar notebooks, business cards, coupons, etc.) and presentation marketing mediums (ex. print media such as newspaper, magazines; TV; movies; computer presentations; interactive CD ROM; kiosks, and Web pages, etc.).
- 25.03 Identify design characteristics (fonts, size and styles, backgrounds, etc.) that are suited for each type of presentation format and material.
- 25.04 Demonstrate knowledge of copyright laws including copyright statue, disclaimers, and filing procedures.
- 25.05 Research and identify skills needed for career positions in multimedia.
- 25.06 Demonstrate an understanding of graphic and other file formats (e.g., EPS, TIFF, JPEG, ASCII, MPEG, MIDI, AVI, WAV, etc.) and knowledge of image size when scanning and saving files for use in different presentation types (Web, computer, print, etc.).
- 25.07 Demonstrate knowledge of presentation vocabulary/terms.

26.0 Demonstrate proficiency in using presentation software and equipment - The student will be able to:

- 26.01 Produce a simple presentation that includes handouts and present it using a projection system.

27.0 Demonstrate proficiency in using a WYSIWG editor, web design, or web animation software for web page creation - The student will be able to:

- 27.01 Create and edit images, photographs for Web pages using digital imaging software (e.g. ImageReady in Photoshop).
- 27.02 Optimize images to make them “Web ready”.
- 27.03 Demonstrate knowledge of image formats related to photos and graphics on the Internet (e.g. Graphic formats (Tiff & EPS), Web formats (JEPG, GIF, PNG), etc.).

27.04 Demonstrate an understanding of photograph compression factors such as transmission speed, color reduction, and browser support.
27.05 Save and export a photograph to the Web in the format best for image quality and file size.

28.0 Demonstrate proficiency in using digital photography and digital imaging - The student will be able to:

28.01 Demonstrate knowledge of ethics related to digital imaging, and legal and consent issues.
28.02 Apply effective design principles in digital photography compositions.
28.03 Illustrate the essence of an event, quote, or slogan through digital photography/imaging.
28.04 Demonstrate skill in using digital imaging software for image manipulation, color correction, and special effects to creatively convey a message or literary interpretation.
28.05 Demonstrate skill in scanning and cropping photographs.
28.06 Incorporate scanned or digitally taken photographs into documents (poster, brochure, card, photo journalism story, report or book covers, letterhead, etc.) that have been designed using desktop publishing software or the desktop publishing features of word processing software.

31.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

31.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
31.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
31.03 Present information formally and informally for specific purposes and audiences. AF2.9

32.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

32.01 Demonstrate knowledge of arithmetic operations. AF3.2
32.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
32.03 Construct charts/tables/graphs using functions and data. AF3.5

33.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

33.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
33.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Digital Video and Sound Fundamentals**
Course Number: **8207420**
Course Credit: **1**

Course Description:

This course covers advanced planning and video editing for multimedia presentations. Students design presentations through various steps of development, implementation, and final output.

29.0 Demonstrate proficiency in using presentation software and equipment - The student will be able to:

- 29.01 Using presentation software, create a multimedia presentation that incorporates shot and edited video, animation, music, narration and adheres to good design principles, use of transitions, and effective message conveyance.
- 29.02 Demonstrate knowledge of the roles and responsibilities of a multimedia production team (e.g. project manager, creative or design director, content experts, writers, graphic designers, animators, sound designers, videographer, interface designers/programmers, etc.).
- 29.03 Collaborate with team members to plan, edit, evaluate, and present a multimedia presentation.

30.0 Demonstrate proficiency using video editing software and equipment—The student will be able to:

- 30.01 Demonstrate knowledge of video and sound editing vocabulary, terms, and acronyms.
- 30.02 Demonstrate knowledge of non-linear editing software (NLEs) and compare the strengths and weaknesses of these programs.
- 30.03 Identify components of non-linear video editing equipment.
- 30.04 Set-up non-linear video editing equipment.
- 30.05 Compare offline to “real time” video editing.
- 30.06 Use storyboarding to plan a short nonlinear video project that includes existing video footage with a title, transitions, background sound, voice-over, animation, and rolling credits.
- 30.07 Create and edit a movie using video editing software that includes existing video footage with a title, transitions, background sound, voice-over, and rolling credits and output to video.
- 30.08 Collaborate with team members to create a short movie utilizing good lighting and sound: plan, shoot, and edit video footage as a team.
- 30.09 Using a video editor, create animated GIFs.
- 30.10 Collaborate with team members to plan, edit, and shoot video footage utilizing advanced video editing techniques and output to video.
- 30.11 Discuss the use of batch processing and project trimming.

30.12 Plan, create, edit and present a short nonlinear QuickTime movie with title, transitions, sub and virtual clips, sound, background music, voice-over, and credits.

34.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

34.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
34.02 Locate, organize and reference written information from various sources. CM 3.0
34.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
34.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
34.05 Apply active listening skills to obtain and clarify information. CM 7.0
34.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
34.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

35.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

35.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
35.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
35.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
35.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

36.0 Use information technology tools. – The student will be able to:

36.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
36.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
36.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
36.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

37.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

37.01 Describe the nature and types of business organizations. SY 1.0
37.02 Explain the effect of key organizational systems on performance and quality.
37.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
37.04 Explain the impact of the global economy on business organizations.

40.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

40.01	Evaluate and justify decisions based on ethical reasoning.	ELR 1.0
40.02	Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies.	ELR1.1
40.03	Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace.	ELR1.2
40.04	Interpret and explain written organizational policies and procedures.	ELR 2.0

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Web Design 1**
Course Number: **8207110**
Course Credit: **1**

Course Description:

This course is designed to provide a basic overview of the Internet, Intranet, and WWW. The content includes operating systems; basic HTML commands; navigation of the Internet, Intranet, and Web; and Web page design.

01.0 Participate in work-based learning experiences — The student will be able to:

- 01.01 Participate in work-based learning experiences in a Web Design environment.
- 01.02 Discuss the use of technology in a Web Design Services (Web Design) environment.
- 01.03 Compare and contrast the software applications used in a Web Design Services (Web Design) environment.

02.0 Perform e-mail activities — The student will be able to:

- 02.01 Describe e-mail capabilities and functions.
- 02.02 Create and send e-mail messages with attachments.
- 02.03 Reply to and forward e-mail messages.
- 02.04 Organize and manage e-mail messages.
- 02.05 Utilize all applicable e-mail options and functions.
- 02.06 Use the Internet to perform e-mail activities.
- 02.07 Define the standards used by Internet/Intranet e-mail (e.g., pop3, mime).
- 02.08 Describe the issues involved in sending and receiving documents as e-mail attachments.
- 02.09 Identify privacy issues in the employee/employer relationship (e.g., avoid libel, spam, personal usage).

03.0 Demonstrate proficiency using operating systems — The student will be able to:

- 03.01 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
- 03.02 Describe the difference between relative and absolute path commands.
- 03.03 Demonstrate a working knowledge of standard file formats.
- 03.04 Demonstrate proficiency with help references.

04.0 Perform decision making activities - The student will be able to:

- 04.01 Determine work priorities.
- 04.02 Evaluate and select appropriate software packages to complete assigned tasks.
- 04.03 Evaluate information to be used and choose relevant material.
- 04.04 Determine the audience.
- 04.05 Compare and select appropriate multimedia tools.

05.0 Demonstrate proficiency navigating the Internet, intranet, and the WWW — The student will be able to:

- 05.01 Identify and describe Web terminology.
- 05.02 Describe the history of the Internet and intranet.
- 05.03 Describe the difference between a client and a server.
- 05.04 Describe the difference between the Internet, intranet, and WWW.
- 05.05 Describe the different methods by which information may be accessed on the Internet/intranet (e.g., browser, FTP, gopher, telnet, veronica).
- 05.06 List the available resources and services on the Internet (e.g., electronic commerce, personal, government, business, etiquette, education, distance learning).
- 05.07 Locate information on the Internet/intranet using a Web browser.
- 05.08 Copy information from the Internet/intranet, save, and print using a Web browser.
- 05.09 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
- 05.10 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
- 05.11 Identify and use search engines to locate information.
- 05.12 Describe the various ways of communicating on the Internet/Intranet (e.g., e-mail, forums, IRC, CHAT, Listserv, Usenet, MOOs, etc.).
- 05.13 Describe and observe Internet/intranet ethics and copyright laws.
- 05.14 Identify methods to protect personal copyright.

06.0 Demonstrate proficiency using HTML commands — The student will be able to:

- 06.01 Identify elements of a Web page.
- 06.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
- 06.03 Define basic HTML terminology.
- 06.04 Analyze HTML source code developed by others.
- 06.05 Create a Web page using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
- 06.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
- 06.07 Add graphics to Web pages.
- 06.08 Edit and test HTML documents for accuracy and validity.
- 06.09 Use basic functions of HTML editors and converters.
- 06.10 Use basic functions of WYSIWYG editors.

07.0 Demonstrate proficiency in page design applicable to the WWW — The student will be able to:

- 07.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
- 07.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
- 07.03 Identify and convert graphic formats.
- 07.04 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD ROMS).

07.05 Use image design software to create and edit images.

08.0 Develop an awareness of Internet/intranet tools - The student will be able to:

08.01 Describe the various hardware components used on the Internet/Intranet.
08.02 Demonstrate the use of compression programs.
08.03 Demonstrate the use of backups.

38.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

38.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
38.02 Explain emergency procedures to follow in response to workplace accidents.
38.03 Create a disaster and/or emergency response plan. SHE 2.0

39.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

39.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
39.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
39.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
39.04 Employ mentoring skills to inspire and teach others. LT 5.0

41.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

41.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
41.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
41.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
41.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
41.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
41.06 Identify and exhibit traits for retaining employment. ECD 7.0
41.07 Identify opportunities and research requirements for career advancement. ECD 8.0
41.08 Research the benefits of ongoing professional development. ECD 9.0
41.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

42.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

42.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
42.02 Describe the effect of money management on personal and career goals. FL 3.0
42.03 Develop a personal budget and financial goals. FL3.1
42.04 Complete financial instruments for making deposits and withdrawals. FL3.2
42.05 Maintain financial records. FL3.3
42.06 Read and reconcile financial statements. FL3.4
42.07 Research, compare and contrast investment opportunities.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Network Systems Administration**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	8207440	B079300
CIP Number	0507.030405	0507.030405
Grade Level	9-12, 30, 31	30, 31
Standard Length	7 credits	1050 hours
Teacher Certification	BUS ED 1 @2 VOE @7 TEACH CBE @7 BUS DP @7 G ELECT DP @7 G BOOKKEEPIN @4 7 G CLERICAL @7 G SECRETAR @7 G TEC ELEC $7 G COMPU SCI 6 COMP SVC @ 7 G	BUS ED 1 @2 VOE @7 TEACH CBE @7 BUS DP @7 G ELECT DP @7 G BOOKKEEPIN @4 7 G CLERICAL @7 G SECRETAR @7 G TEC ELEC $7 G COMPU SCI 6 COMP SVC @ 7 G
CTSO	FBLA BPA	Phi Beta Lambda BPA
SOC Codes (all applicable)	15-1041; 15-1071; 15-1081	15-1041; 15-1071; 15-1081
Facility Code	[212] http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	Mathematics: 9.0 Language: 9.0 Reading: 9.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as a Computer Support Assistant, Network

Support Technician, Systems Administrator, Systems Engineer, Wireless Network Administrator, and Data Communications Analyst in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to instruction in computer literacy; software application support; basic hardware configuration and troubleshooting; networking technologies, troubleshooting, security, and administration; and customer service and human relations skills.

Program Structure

This program is a planned sequence of instruction consisting of the Business Technology Education Core and six additional occupational completion points. Secondary or postsecondary students who have previously completed the Business Technology Education Core will not have to repeat the core. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or exit as an occupational completer.

When offered at the post secondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	OTA0040	Information Technology Assistant	150	15-1041
B	EEV0504	Computer Support Assistant	150	15-1041
C	CTS0026	Network Support Technician	150	15-1071
D	CTS0027	Systems Administrator	150	15-1071
E	CTS0028	Systems Engineer	150	15-1081
F	CTS0029	Wireless Network Administrator	150	15-1081
G	EEV0317	Data Communications Analyst	150	15-1081

** Note: OTA0040 is a core program.*

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8200320	Keyboarding and Business Skills	.5 credit	15-1061	2
		AND			
	8200330	Computer and Business Skills	.5 credit		2
		OR			
	8209020	Computing for College and Careers	1 credit		2

OCP	Course Number	Course Title	Length	SOC Code	Level
		OR			
	8207310	Introduction to Information Technology	1 credit		2
B	8207020	Networking 1	1 credit	15-1041	2
C	8207441	Networking 2, Administration	1 credit	15-1071	3
D	8207442	Networking 3, Administration	1 credit	15-1071	3
E	8207443	Networking 4, Administration	1 credit	15-1081	3
F	8207060	Networking 5	1 credit	15-1081	3
G	8207070	Networking 6	1 credit	15-1081	3

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills for secondary students. For postsecondary students, Phi Beta Lambda and BPA are the appropriate student organizations. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 9.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List

document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of

the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

The PSAV component of this program (B079300) has two statewide articulation agreement approved by the Articulation Coordinating Committee:

1. Networking Services Technology AS/AAS (0507030401/1507030401) – 9 credits (12 credits if implemented as a Microsoft MCSA track)

2. Computer Engineering Technology AAS/AS (0615040200/1615040200) – 9 credits (12 credits if implemented as a Microsoft MCSA track)

   For both of the above agreements, three additional credits awarded if implementation includes wireless coursework or CompTIA Linux+ and Server+ coursework.

For details on articulation agreements which correlate to programs and industry certifications refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

After successfully completing this program, the student will be able to perform the following:

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member.
05.0 Practice quality performance in the learning environment and the workplace.

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning though job shadowing, mentoring, e-coaching, etc.
08.0 Demonstrate personal and interpersonal skills appropriate for the workplace.
09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use Technology to apply and enhance communications skills in technical reading, writing.
04.0 Practice quality performance in the learning environment and the workplace.
05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
09.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
11.0 Perform e-mail activities.
12.0 Demonstrate operating systems.
13.0 Develop an awareness of emerging technologies.

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance and enhance personal performance in relation to the workplace. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal and professional ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
10.0 Demonstrate personal and interpersonal skills and attributes appropriate for the workplace.
11.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
12.0 Perform e-mail activities.
13.0 Demonstrate operating systems.
14.0 Develop an awareness of emerging technologies.

OR

Introduction to IT Competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.
02.0 Demonstrate Comprehension and communication skills.
03.0 Use technology to enhance the effectiveness of communication skills.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.
10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
11.0 Participate in work-based learning experiences.
12.0 Perform e-mail activities.
13.0 Demonstrate knowledge of different operating systems.
14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW.
15.0 Demonstrate proficiency using HTML commands.

16.0 Demonstrate proficiency in page design applicable to the WWW.
17.0 Demonstrate proficiency using specialized web design software.
18.0 Develop an awareness of the information technology industry.
19.0 Develop an awareness of microprocessors and digital computers.
20.0 Develop an awareness of programming languages.
21.0 Develop an awareness of emerging technologies.
22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model.
23.0 Demonstrate proficiency using common software applications.
24.0 Demonstrate proficiency using specialized software applications.

Program Standards

25.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
26.0 Identify, install, configure, and upgrade desktop and server computer modules and peripherals, following established basic procedures for system assembly and disassembly of field replaceable modules.
27.0 Diagnose and troubleshoot common module problems and system malfunctions of computer software, hardware, peripherals, and other office equipment.
28.0 Identify issues, procedures and devices for protection within the computing environment, including people, hardware and the surrounding workspace.
29.0 Identify specific terminology, facts, ways and means of dealing with classifications, categories and principles of motherboards, processors and memory in desktop and server computer systems.
30.0 Demonstrate knowledge of basic types of printers, basic concepts, printer components, how they work, how they print onto a page, paper path, care and service techniques, and common problems.
31.0 Identify and describe basic network concepts and terminology, ability to determine whether a computer is networked, knowledge of procedures for swapping and configuring network interface cards, and knowledge of the ramifications of repairs when a computer is networked.
32.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, remote access, or direct contact.
33.0 Demonstrate proficiency using graphical user interface (GUI) operating systems.
34.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
35.0 Participate in work-based learning experiences.
36.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, remote access, or direct contact.
37.0 Perform installation and configuration activities.
38.0 Demonstrate proficiency using computer networks.
39.0 Demonstrate proficiency in configuring and troubleshooting hardware devices and drivers.
40.0 Demonstrate proficiency in managing, monitoring, and optimizing system performance, reliability and availability.
41.0 Demonstrate proficiency in managing, configuring and troubleshooting storage use.
42.0 Demonstrate proficiency in configuring and troubleshooting network connections.
43.0 Demonstrate proficiency in implementing, monitoring, and troubleshooting security.

44.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
45.0 Participate in work-based learning experiences.
46.0 Administer accounts and resources on computers running server operating system software in a networked environment.
47.0 Modify user and computer accounts on computers running a server operating system in a networked environment.
48.0 Perform various administrative functions using groups.
49.0 Enable resource access with permissions, manage access to files and folders using permissions, and manage permission inheritance.
50.0 Implement printing in a networked environment utilizing a particular server operating system.
51.0 Set up a network-wide printing strategy to meet the needs of users and troubleshoot installation or configuration problems.
52.0 Utilize available permissions for managing access to global directory objects, how to move objects between organizational units in the same domain, and how to delegate control of an organizational unit.
53.0 Use group policy to configure folder redirection, browser connectivity, and the desktop.
54.0 Manage computer security in a networking environment.
55.0 Administer servers remotely.
56.0 Monitor server performance by using performance tools, configure and manage performance logs, configure and manage alerts, and manage system monitor views.
57.0 Collect performance data by monitoring primary server subsystems and identify system bottlenecks by using the performance monitoring software.
58.0 Maintaining device drivers.
59.0 Use software tools to manage and set up disks.
60.0 Use file encryption for security of data.
61.0 Plan for a computer disaster and use the features of a server operating system to prevent a disaster or recover when one occurs.
62.0 Manage and distribute critical software updates that resolve known security vulnerabilities and other stability issues.
63.0 Construct and assign IP addresses and isolate addressing issues associated with the IP routing process.
64.0 Configure an internet protocol (IP) address for client computers.
65.0 Configure name resolution mechanisms for clients on a network and describe the name resolution process.
66.0 Isolate common connectivity issues and describe how to use utilities and tools as part of this process.
67.0 Configure a routing solution for a network environment.
68.0 Allocate IP addressing in a network environment.
69.0 Manage the DHCP service to reflect changing client IP addressing needs and monitor DHCP server performance.
70.0 Assign computer names to the IP addresses of the source and destination hosts, and then use the computer name to contact the hosts.
71.0 Resolve host names by using domain name system.
72.0 Manage and monitor DNS servers to ensure that they are functioning properly and to optimize network performance.
73.0 Configure a server with the routing and remote access service, create appropriate remote access connections on a network access server, and configure users' access rights.

74.0 Manage and monitor network access and the network access services.
75.0 Perform installation of a network client operating system.
76.0 Install and configure hardware devices.
77.0 Configure and manage file systems.
78.0 Troubleshoot the boot process and other system issues.
79.0 Configure the desktop.
80.0 Configure IP addresses and name resolution.
81.0 Configure the client to work in a network environment.
82.0 Support remote users.
83.0 Configure a client OS for mobile computing.
84.0 Monitor resources and performance.
85.0 Apply communication skills (reading, writing, speaking, listening, and viewing) in a courteous, concise, and correct manner on personal and professional levels.
86.0 Participate in work-based learning experiences.
87.0 Plan a network infrastructure.
88.0 Plan and optimize a TCP/IP physical and logical network.
89.0 Plan and troubleshoot routing.
90.0 Plan a DHCP strategy.
91.0 Plan a DNS strategy.
92.0 Optimize and troubleshoot DNS.
93.0 Plan and troubleshoot IPSEC.
94.0 Plan a network access.
95.0 Troubleshoot network access.
96.0 Analyze global director infrastructure.
97.0 Implement a global directory structure and domain.
98.0 Implement an organizational unit structure.
99.0 Implement user, group, and computer accounts.
100.0 Implement group policy.
101.0 Deploy and manage software by using group policies.
102.0 Implement sites to manage global directory replication.
103.0 Implement placement of domain controllers.
104.0 Use a framework for designing security and create a security design team.
105.0 Recognize and predict common threats by using a threat model.
106.0 Apply a framework for planning risk management.
107.0 Design security for physical resources.
108.0 Design security for computers.
109.0 Design security for accounts.
110.0 Design security for authentication.
111.0 Design security for data.
112.0 Design security for data transmission.
113.0 Design security for network perimeter.
114.0 Design an audit policy and an incident response procedure.
115.0 Participate in work-based learning experiences.
116.0 Demonstrate proficiency in applying radio frequency (RF) technologies.
117.0 Develop an awareness of wireless LAN technologies.
118.0 Perform implementation and management activities.
119.0 Develop an awareness of wireless security systems.
120.0 Demonstrate knowledge of wireless industry standards.
121.0 Participate in work-based learning experiences.
122.0 Demonstrate knowledge of general security concepts.
123.0 Develop an awareness of communication security concepts.

124.0 Develop an awareness of network infrastructure security.
125.0 Develop an awareness of cryptography and its relation to security.
126.0 Incorporate organizational and operational security in an appropriate and effective manner.
127.0 Demonstrate language arts knowledge and skills.
128.0 Demonstrate mathematics knowledge and skills.
129.0 Demonstrate science knowledge and skills.
130.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
131.0 Solve problems using critical thinking skills, creativity and innovation.
132.0 Use information technology tools.
133.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
134.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
135.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
136.0 Describe the importance of professional ethics and legal responsibilities.
137.0 Explain the importance of employability skill and entrepreneurship skills.
138.0 Demonstrate personal money-management concepts, procedures, and strategies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Network Support Services**
PSAV Number: **B078000**

Course Number: OTA0040
Occupational Completion Point – A
Information Technology Assistant – 150 Hours – SOC Code 15-1041

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Demonstrate basic file management skills.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 03.01 Select and use word processing software and accompanying features to enhance written business communications.
- 03.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.
- 03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

07.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
07.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
07.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
07.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

08.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

08.01 Accept constructive criticism.
08.02 Apply appropriate strategies to manage and resolve conflict in work situations.
08.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

09.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
09.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic file management skills.
01.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

02.01 Take notes, organize, summarize, and paraphrase ideas and details.
02.02 Accurately follow written and oral instructions.
02.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
03.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

04.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
04.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

05.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
05.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
05.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
06.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
06.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

07.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
07.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

07.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

08.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
08.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
08.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
08.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
08.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
08.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
08.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
08.08 Build mentor relationships with local professionals in the industry.

09.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

09.01 Accept constructive criticism.
09.02 Apply appropriate strategies to manage and resolve conflict in work situations.
09.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

10.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

11.0 Perform e-mail activities. – The student will be able to:

11.01 Describe e-mail capabilities and functions.
11.02 Use the Internet to perform e-mail activities.

12.0 Demonstrate operating systems. – The student will be able to:

12.01 Identify operating system file naming conventions.

12.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
12.03 Demonstrate a working knowledge of standard file formats.
12.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

13.0 Develop an awareness of emerging technologies. – The student will be able to:

13.01 Compare and contrast various methods of evaluation for emerging technologies.
13.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
13.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance-The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic computer file management skills.
01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills-The student will be able to:

02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
02.02 Write clear and well-organized research papers, integrating a variety of information.
02.03 Prepare and deliver an oral report with appropriate materials to the class
02.04 Participate in large group discussions as a member and/or a leader.
02.05 Take notes, organize, summarize, and paraphrase ideas and details.
02.06 Accurately follow written and oral instructions.
02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills-The student will be able to:

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles-The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace-The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance-The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance-The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals-The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals-The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up).
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace-The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance-The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities–The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems–The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies-The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Introduction to Information Technology competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance — The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills — The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

- 03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
- 03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles — The student will be able to:

- 04.01 Explore, design, implement, and evaluate organizational structures and cultures.
- 04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
- 04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace — The student will be able to:

- 05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
- 05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance — The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance — The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals — The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals — The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace — The student will be able to:

10.01 Accept constructive criticism.
10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences — The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.
12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.
12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the www – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).

14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using html commands – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the www – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software - The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry - The student will be able to
:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers - The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages - The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies - The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the open systems interface (osi) model - The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications - The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications - The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

Course Number: EEV0504
Occupational Completion Point – B
Computer Support Assistant – 150 Hours – SOC Code 15-1041

25.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance - The student will be able to:

25.01 Develop strategies for resolving customer conflicts.

26.0 Identify, install, configure, and upgrade desktop and server computer modules and peripherals, following established basic procedures for system assembly and disassembly of field replaceable modules - The student will be able to:

26.01 Identify and describe the functions of main processing boards (e.g., CPUs, RAM, ROM, bus architecture).
26.02 Identify and describe the functions of communication ports (e.g., serial and parallel ports).
26.03 Identify and describe the functions of peripheral devices (e.g., scanners, modems, hard drives, printers.
26.04 Identify and describe the components of portable systems (e.g., battery, LCD, AC adapter, PDAs).
26.05 Troubleshoot, install and upgrade computers and peripherals.
26.06 Perform system hardware setup Demonstrate an understanding of input/output devices.
26.07 Installation and configuration of applications software, hardware, and device drivers.
26.08 Demonstrate an understanding of the operation and purpose of hardware components.
26.09 Install operating system software.
26.10 Customize operating systems.
26.11 Install application software.
26.12 Perform storage formatting and preparation activities.
26.13 Identify data measurement (e.g., bits, bytes, kilobytes).

26.14 Install and Configure RAID.
26.15 Recognize and report on server room environmental issues (temperature, humidity/ESD/power surges, back-up).

27.0 Diagnose and troubleshoot common module problems and system malfunctions of computer software, hardware, peripherals, and other office equipment - The student will be able to:

27.01 Troubleshoot a personal computer system
27.02 Identify configuration problems.
27.03 Identify software problems.
27.04 Identify hardware malfunctions.
27.05 Identify network malfunctions
27.06 Resolve computer error messages.
27.07 Understand and troubleshoot memory and cache systems.
27.08 Verify that drives are the appropriate type.
27.09 Describe knowledge database search procedures used to identify possible solutions when troubleshooting software and hardware problems.

28.0 Identify issues, procedures and devices for protection within the computing environment, including people, hardware and the surrounding workspace - The student will be able to:

28.01 Apply basic rules for hardware safety.
28.02 Demonstrate proficiency in basic preventative hardware maintenance.
28.03 Special disposal procedures that comply with environmental guidelines for batteries, CRTs, toner kits/cartridges, chemical solvents and cans, and MSDS.
28.04 Apply ergonomic principles applicable to the configuration of computer workstations.
28.05 Describe ethical issues and problems associated with computers and information systems.

29.0 Identify specific terminology, facts, ways and means of dealing with classifications, categories and principles of motherboards, processors and memory in desktop and server computer systems - The student will be able to:

29.01 Identify EDO RAM, DRAM, SRAM, RIMM, VRAM, SDRAM, and WRAM.
29.02 Identify memory banks, memory chips (8-bit, 16-bit, and 32-bit), SIMMS (Single In-line Memory Module), DIMMS (Dual In-line Memory Module), parity chips versus non-parity chips.
29.03 Identify printer parallel port, COM/serial port, floppy drive, hard drive, Memory, and Boot sequence.

30.0 Demonstrate knowledge of basic types of printers, basic concepts, printer components, how they work, how they print onto a page, paper path, care and service techniques, and common problems - The student will be able to:

30.01 Identify types of printers—Laser, Inkjet, Dot Matrix.
30.02 Identify care and service techniques and common problems with primary printer types.
30.03 Implement and manage printing on a network.

31.0 Identify and describe basic network concepts and terminology, ability to determine whether a computer is networked, knowledge of procedures for swapping and configuring network interface cards, and knowledge of the ramifications of repairs when a computer is networked - The student will be able to:

31.01 Define networking and describe the purpose of a network.
31.02 Identify the purposes and interrelationships among the major components of networks (e.g., servers, clients, transmission media, network operating system, network boards).
31.03 Describe the various types of network topologies.
31.04 Identify and describe the purpose of standards, protocols, and the Open Systems Interconnection (OSI) reference model.
31.05 Configure network and verify network connectivity.
31.06 Discuss the responsibilities of the network administrator (e.g., rights and responsibilities).
31.07 Develop user logon procedures.
31.08 Utilize network management infrastructures (e.g., network monitoring, alerting, security) to perform administrative tasks.
31.09 Identify common backup strategies and procedures.
31.10 Select and use appropriate electronic communications software and hardware for specific tasks.
31.11 Compare and contrast Internet software and protocols.
31.12 Diagnose and resolve electronic communications operational problems.
31.13 Design and implement directory tree structures.
31.14 Install services tools (SNMP, backup software)
31.15 Perform full backup and verify backup
31.16 Identify bottlenecks (e.g., processor, bus transfer, I/O, disk I/O, network I/O, memory).
31.17 Use the concepts of fault tolerance/fault recovery to create a disaster recovery plan.
31.18 Document and test disaster recovery plan regularly, and update as needed.

32.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, internet, remote access, or direct contact - The student will be able to:

32.01 Apply call center vocabulary.
32.02 Listen and input information simultaneously.
32.03 Apply first response assistance for minor repair work.

33.0 Demonstrate proficiency using graphical user interface (GUI) operating systems - The student will be able to:

33.01 Identify parts of GUI windows.
33.02 Create and use icons.
33.03 Demonstrate proficiency in using menu systems.
33.04 Demonstrate proficiency in using pointing and selection devices.
33.05 Identify keyboard shortcuts and special function keys.
33.06 Demonstrate proficiency in manipulating windows.
33.07 Utilize help systems and hypertext links.
33.08 Create, organize, and maintain file system directories.

33.09 Organize desktop objects.
33.10 Run multiple applications.

127.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

127.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
127.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
127.03 Present information formally and informally for specific purposes and audiences. AF2.9

128.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

128.01 Demonstrate knowledge of arithmetic operations. AF3.2
128.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
128.03 Construct charts/tables/graphs using functions and data. AF3.5

129.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

129.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
129.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

Course Number: CTS0026
Occupational Completion Point – C
Network Support Technician – 150 Hours – SOC Code 15-1071

34.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance - The student will be able to:

34.01 Develop diplomatic methods to communicate with customers.

35.0 Participate in work-based learning experiences - The student will be able to:

35.01 Participate in work-based learning experiences in a network support services environment.
35.02 Discuss the use of technology in a network environment.

36.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, remote access, or direct contact - The student will be able to:

36.01 Apply first response assistance for minor repair work.

37.0 Perform installation and configuration activities - The student will be able to:

37.01 Configure the operating system environment.
37.02 Connect client workstation running similar operating system to the network.
37.03 Configure Internet access for a network.

37.04 Configure a Web server.
37.05 Use remote server to deploy operating system.
37.06 Troubleshoot failed installations.
37.07 Install and configure network services for interoperability.
37.08 Monitor, configure troubleshoot and control access to printers.
37.09 Monitor, configure troubleshoot and control access to files, folders, and shared folders.
37.10 Monitor, configure troubleshoot and control access to Web sites.

38.0 Demonstrate proficiency using computer networks - The student will be able to:

38.01 Identify and describe the purpose of standards, protocols, and the Open Systems Interconnection (OSI) reference model.

39.0 Demonstrate proficiency in configuring and troubleshooting hardware devices and drivers - The student will be able to:

39.01 Configure hardware devices.
39.02 Configure driver signing options.
39.03 Update device drivers.
39.04 Troubleshoot problems with hardware.

40.0 Demonstrate proficiency in managing, monitoring, and optimizing system performance, reliability and availability - The student will be able to:

40.01 Monitor and optimize usage of system resources.
40.02 Manage processes.
40.03 Optimize disk performance.
40.04 Manage and optimize availability of system data and user data.
40.05 Recover systems and user data.

41.0 Demonstrate proficiency in managing, configuring and troubleshooting storage use – The student will be able to:

41.01 Configure and manage user profiles.
41.02 Monitor, configure and troubleshoot disks and volumes.
41.03 Configure data compression.
41.04 Monitor and configure disk quotas.
41.05 Recover from disk failures.

42.0 Demonstrate proficiency in configuring and troubleshooting network connections - The student will be able to:

42.01 Install, configure and troubleshoot shared access.
42.02 Install, configure and troubleshoot a virtual private network.
42.03 Install, configure and troubleshoot network protocols.
42.04 Install and configure network services.
42.05 Configure, monitor and troubleshoot remote access.
42.06 Install, configure, monitor, and troubleshoot Terminal Services.
42.07 Configure the properties of a connection.
42.08 Install, configure, and troubleshoot network adapters and drivers.

43.0 Demonstrate proficiency in implementing, monitoring, and troubleshooting security - The student will be able to:

43.01 Encrypt data on a hard disk by using Encrypting File System.
43.02 Implement, configure, manage and troubleshoot policies in an operating system environment.
43.03 Implement, configure, manage and troubleshoot auditing.
43.04 Implement, configure, manage and troubleshoot local accounts.
43.05 Implement, configure, manage and troubleshoot account policy.
43.06 Implement, configure, manage and troubleshoot security by using the Security Configuration Tool Set.

130.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

130.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
130.02 Locate, organize and reference written information from various sources. CM 3.0
130.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
130.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
130.05 Apply active listening skills to obtain and clarify information. CM 7.0
130.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
130.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

131.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

131.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
131.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
131.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
131.04 Conduct technical research to gather information necessary for decision-making. PS 4.0

132.0 Use information technology tools. – The student will be able to:

132.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
132.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
132.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
132.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

133.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

133.01 Describe the nature and types of business organizations. SY 1.0
133.02 Explain the effect of key organizational systems on performance and quality.
133.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
133.04 Explain the impact of the global economy on business organizations.

136.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

136.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
136.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
136.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
136.04 Interpret and explain written organizational policies and procedures. ELR 2.0

Course Number: CTS0027
Occupational Completion Point – D
Systems Administrator – 150 Hours – SOC Code 15-1071

44.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance - The student will be able to:

44.01 Develop diplomatic methods to communicate with customers, clients, and end-users of information technology services.

45.0 Participate in work-based learning experiences – The student will be able to:

45.01 Participate in work-based learning experiences in a network support services environment.
45.02 Discuss the use of technology in a network support services environment.
45.03 Discuss the management/supervisors skills needed in a network support services environment.

46.0 Administer accounts and resources on computers running server operating system software in a networked environment - The student will be able to:

46.01 Describe features of server operating system.
46.02 Log on to the server operating system.
46.03 Install and configure administrative tools.
46.04 Create user accounts.
46.05 Create computer accounts.
46.06 Create an organizational unit.

47.0 Modify user and computer accounts on computers running a server operating system in a networked environment - The student will be able to:

47.01 Modify user and computer account properties.
47.02 Enable and unlock user and computer accounts.

47.03 Create a user account template.
47.04 Locate user and computer accounts in a global directory structure.
47.05 Save queries.
47.06 Reset user and computer accounts.
47.07 Move domain objects.

48.0 Perform various administrative functions using groups - The student will be able to:

48.01 Create groups.
48.02 Manage group membership
48.03 Apply strategies for using groups
48.04 Modify groups.
48.05 Manage default groups.

49.0 Enable resource access with permissions, manage access to files and folders using permissions, and manage permission inheritance - The student will be able to:

49.01 Manage access to resources.
49.02 Manage access to shared folders.
49.03 Manage access to files and folders by using file system permissions.
49.04 Determine effective permissions.
49.05 Manage access to shared files by using offline caching.

50.0 Implement printing in a networked environment utilizing a particular server operating system - The student will be able to:

50.01 Install and share printers.
50.02 Manage access to printers by using shared printer permissions.
50.03 Manage printer drivers.
50.04 Implement printer locations.

51.0 Set up a network-wide printing strategy to meet the needs of users and troubleshoot installation or configuration problems - The student will be able to:

51.01 Change the location of the print spooler.
51.02 Set printing priorities.
51.03 Schedule printer availability.
51.04 Configure a printing tool.

52.0 Utilize available permissions for managing access to global directory objects, how to move objects between organizational units in the same domain, and how to delegate control of an organizational unit - The student will be able to:

52.01 Identify the role of organizational units.
52.02 Modify permissions for global directory objects.
52.03 Delegate control of organizational units.

53.0 Use group policy to configure folder redirection, browser connectivity, and the desktop - The student will be able to:

53.01 Configure group policy settings.

53.02 Assign scripts with group policy.
53.03 Configure folder redirection.

54.0 Manage computer security in a security in a networking environment - The student will be able to:

54.01 Describe the security features a server operating system.
54.02 Use security templates to secure computers.
54.03 Test computer security policy.
54.04 Configure auditing.
54.05 Manage security logs.

55.0 Administer servers remotely - The student will be able to:

55.01 Explain the tasks, tools, and rights that are required to administer a server.
55.02 Configure remote access for administration and client preferences.
55.03 Manage remote desktop connections.

56.0 Monitor server performance by using performance tools, configure and manage performance logs, configure and manage alerts, and manage system monitor views - The student will be able to:

56.01 Establish a performance baseline.
56.02 Perform real-time and logged monitoring.
56.03 Configure and manage counter logs.
56.04 Configure alerts.

57.0 Collect performance data by monitoring primary server subsystems and identify system bottlenecks by using the performance monitoring software - The student will be able to:

57.01 Explain how the four primary server subsystems affect server performance.
57.02 Monitor server memory.
57.03 Monitor processor usage.
57.04 Monitor disks.
57.05 Monitor network usage.
57.06 Identify the guidelines for using counters and thresholds.
57.07 Describe the best practices for monitoring server performance**.**

58.0 Maintaining device drivers - The student will be able to:

58.01 Configure device driver signing.
58.02 Restore the previous version of a device driver.

59.0 Use software tools to manage and set up disks - The student will be able to:

59.01 Initialize and partition a disk.
59.02 View and update disk properties.
59.03 Manage mounted drives.
59.04 Create volumes on a disk.
59.05 Convert a disk from basic to dynamic and from dynamic to basic.
59.06 Import disks.

60.0 Use file encryption for security of data - The student will be able to:

60.01 Manage disk based file compression.
60.02 Configure file encryption.
60.03 Implement disk quotas.

61.0 Plan for a computer disaster and use the features of a server operating system to prevent a disaster or recover when one occurs - The student will be able to:

61.01 Prepare for disaster recovery.
61.02 Back up data.
61.03 Schedule backup jobs.
61.04 Restore data.
61.05 Configure a shadow copy.
61.06 Recover from server failure.
61.07 Select a disaster recovery method.

62.0 Manage and distribute critical software updates that resolve known security vulnerabilities and other stability issues - The student will be able to:

62.01 Install and configure client computers to use receive software updates.
62.02 Install and configure servers to use perform software updates.
62.03 Manage the Software Update Services infrastructure.

63.0 Construct and assign IP addresses and isolate addressing issues associated with the ip routing process - The student will be able to:

63.01 Convert IP Addresses from decimal to binary.
63.02 Calculate a subnet mask.
63.03 Create subnets using VLSM and CIDR.
63.04 Isolate addressing issues associated with the IP routing process.

64.0 Configure an internet protocol (IP) address for client computers - The student will be able to:

64.01 Configure a client to use a static IP address.
64.02 Configure a client to obtain an IP address automatically by using DHCP.
64.03 Configure a client to obtain an IP address automatically by using Alternate Configuration.

65.0 Configure name resolution mechanisms for clients on a network and describe the name resolution process - The student will be able to:

65.01 Use ARP to identify client media access control (MAC) addresses.
65.02 Describe the function of Network Basic Input/Output System (NetBIOS).
65.03 Configure a client to use a static IP address.
65.04 Configure a client to use name resolution servers.

66.0 Isolate common connectivity issues and describe how to use utilities and tools as part of this process - The student will be able to:

66.01 Isolate common connectivity issues.
66.02 Use a flow chart to isolate a problem.
66.03 Use utilities and tools to isolate a problem

67.0 Configure a routing solution for a network environment - The student will be able to:

67.01 Describe the role of routing in the network infrastructure.
67.02 Enable and configure the Routing and Remote Access service.
67.03 Configure packet filters.

68.0 Allocate IP addressing in a network environment - The student will be able to:

68.01 Describe the role of DHCP in the network infrastructure.
68.02 Add and authorize a DHCP Server service.
68.03 Configure a DHCP scope.
68.04 Configure DHCP options.
68.05 Configure a DHCP reservation**.**
68.06 Configure a DHCP relay agent.

69.0 Manage the DHCP service to reflect changing client IP addressing needs and monitor DHCP server performance - The student will be able to:

69.01 Manage a DHCP database.
69.02 Monitor DHCP.
69.03 Apply security guidelines for DHCP.

70.0 Assign computer names to the IP addresses of the source and destination hosts, and then use the computer name to contact the hosts - The student will be able to:

70.01 Describe the name resolution process.
70.02 View names on a client.
70.03 Configure host name resolution.

71.0 Resolve host names by using domain name system - The student will be able to:

71.01 Describe the role of DNS in the network infrastructure.
71.02 Install the DNS Server service.
71.03 Configure the properties for the DNS Server service.
71.04 Configure the DNS zones.
71.05 Configure DNS zone transfers.
71.06 Configure dynamic updates.
71.07 Configure a DNS client.
71.08 Delegate authority for zones.

72.0 Manage and monitor DNS servers to ensure that they are functioning properly and to optimize network performance - The student will be able to:

72.01 Configure the Time-to-Live (TTL) value.
72.02 Configure aging and scavenging.
72.03 Integrate DNS with WINS.

72.04 Test the DNS server configuration.
72.05 Monitor DNS server performance**.**

73.0 Configure a server with the routing and remote access service, create appropriate remote access connections on a network access server, and configure users' access rights - The student will be able to:

73.01 Describe a network access infrastructure.
73.02 Configure a virtual private network (VPN) connection.
73.03 Configure a dial-up connection.
73.04 Configure a wireless connection.
73.05 Control remote user access to a network.
73.06 Centralize authentication and policy management for network access by using Internet Authentication Service (IAS).

74.0 Manage and monitor network access and the network access services - The student will be able to:

74.01 Configure logging on the network access server.
74.02 Collect and monitor network access data.

75.0 Perform installation of a network client operating system - The student will be able to:

75.01 Plan a client operating system installation.
75.02 Install a client operating system.
75.03 Upgrade a client operating system from an earlier version.
75.04 Automate the installation process for a client operating system.

76.0 Install and configure hardware devices - The student will be able to:

76.01 Configure hardware devices and drivers on a computer running a client OS.
76.02 Add and remove devices by using built in utilities and wizards
76.03 Restore device drivers**.**

77.0 Configure and manage file systems - The student will be able to:

77.01 Work with file systems.
77.02 Manage data compression.
77.03 Secure data by using EFS.
77.04 Configure disk compression.
77.05 Secure files by using EFS.

78.0 Troubleshoot the boot process and other system issues - The student will be able to:

78.01 Examine the boot process.
78.02 Control system settings during the boot process.
78.03 Change startup behavior.
78.04 Use advanced boot options to troubleshoot startup problems.
78.05 Restore a computer to a previous state.
78.06 Troubleshoot the boot process and other system issues.

79.0 Configure the desktop - The student will be able to:

79.01 Configure user desktop settings.
79.02 Customize the desktop environment.
79.03 Configure system settings.
79.04 Describe how user profiles and group policy affect desktop customization**.**

80.0 Configure IP addresses and name resolution - The student will be able to:

80.01 Configure IP addresses.
80.02 Troubleshoot IP addresses.
80.03 Determine TCP/IP name resolution methods.
80.04 Configure a DNS and WINS client.
80.05 Connect to a remote host.
80.06 Configure IP addresses.
80.07 Configure the DNS client**.**

81.0 Configure the client to work in a network environment - The student will be able to:

81.01 Examine workgroups and user accounts.
81.02 Create and authenticate local user accounts.
81.03 Configure local security.
81.04 Configure logon options.
81.05 Configure networking.
81.06 Join a domain.
81.07 Operate in a domain**.**

82.0 Support remote users - The student will be able to:

82.01 Establish remote access connections.
82.02 Connect to Virtual Private Networks.
82.03 Configure inbound connections.
82.04 Configure authentication protocols and encryption.
82.05 Using remote desktop.
82.06 Store user names and passwords to facilitate remote connections.
82.07 Configure a VPN connection.
82.08 Configure and using remote desktop.
82.09 Store user names and passwords**.**

83.0 Configure a client OS for mobile computing - The student will be able to:

83.01 Configure hardware for mobile computing.
83.02 Configure power management options for mobile computing.
83.03 Make files, folders, and web pages available for offline use.

84.0 Monitor resources and performance - The student will be able to:

84.01 Determine system information.
84.02 Use task manager to monitor system performance.
84.03 Use performance and maintenance tools to improve performance.
84.04 Monitor event logs.

84.05 Configure program compatibility.

134.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

134.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
134.02 Explain emergency procedures to follow in response to workplace accidents.
134.03 Create a disaster and/or emergency response plan. SHE 2.0

135.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

135.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
135.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
135.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
135.04 Employ mentoring skills to inspire and teach others. LT 5.0

137.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

137.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
137.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
137.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
137.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
137.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
137.06 Identify and exhibit traits for retaining employment. ECD 7.0
137.07 Identify opportunities and research requirements for career advancement. ECD 8.0
137.08 Research the benefits of ongoing professional development. ECD 9.0
137.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

138.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

138.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
138.02 Describe the effect of money management on personal and career goals. FL 3.0
138.03 Develop a personal budget and financial goals. FL3.1
138.04 Complete financial instruments for making deposits and withdrawals. FL3.2
138.05 Maintain financial records. FL3.3
138.06 Read and reconcile financial statements. FL3.4
138.07 Research, compare and contrast investment opportunities.

Course Number: CTS0028
Occupational Completion Point – E
Systems Engineer – 150 Hours – SOC Code 15-1081

85.0 Apply communication skills (reading, writing, speaking, listening, and viewing) in a courteous, concise, and correct manner on personal and professional levels - The student will be able to:

85.01 Communicate technical information in a concise, understandable manner to a non-technical audience both verbally and in writing.

86.0 Participate in work-based learning experiences - The student will be able to:

86.01 Participate in work-based learning experiences in a network support services environment.
86.02 Discuss the use of technology in a network support services environment.
86.03 Compare and contrast the software applications used in a network support services environment.

87.0 Plan a network infrastructure - The student will be able to:

87.01 Explain how to plan a network.
87.02 Explain how to prepare development and test environments.
87.03 Explain the concepts of managing and maintaining a network environment by using specific tools.
87.04 Explain the technologies and services implemented in a network.

88.0 Plan and optimize a TCP/IP physical and logical network - The student will be able to:

88.01 Discuss TCP/IP.
88.02 Plan a TCP/IP addressing scheme.
88.03 Optimize network performance.

89.0 Plan and troubleshoot routing - The student will be able to:

89.01 Describe how routing works.
89.02 Create a secure routing plan.
89.03 Identify TCP/IP routing trouble shooting tools.
89.04 Troubleshoot TCP/IP routing.

90.0 Plan a DHCP strategy - The student will be able to:

90.01 Demonstrate how DHCP operates in an enterprise environment.
90.02 Plan a DHCP strategy.
90.03 Secure a DHCP strategy.

91.0 Plan a DNS strategy - The student will be able to:

91.01 Plan a namespace strategy.
91.02 Plan zones.
91.03 Plan zone replication.
91.04 Plan a DNS server implementation.

92.0 Optimize and troubleshoot DNS - The student will be able to:

92.01 Optimize a DNS server.
92.02 Optimize the DNS server-to-server communications.
92.03 Optimize DNS client support traffic.
92.04 Troubleshoot host name resolution.

93.0 Plan and troubleshoot IPSEC - The student will be able to:

93.01 Discuss IPSec.
93.02 Understand IPSec default policies, rules, and settings.
93.03 Plan IPSec deployment.
93.04 Troubleshoot IPSec**.**

94.0 Plan a network access - The student will be able to:

94.01 Select appropriate connection methods for a network access strategy.
94.02 Select a remote access policy strategy.
94.03 Select a network access authentication method.
94.04 Plan a network access strategy.

95.0 Troubleshoot network access - The student will be able to:

95.01 Identify network access troubleshooting resources.
95.02 Troubleshoot network authentication.
95.03 Troubleshoot LAN authentication.
95.04 Troubleshoot remote access.

96.0 Analyze global directory infrastructure - The student will be able to:

96.01 Describe the architecture of global directory.
96.02 Describe the working of global directory.
96.03 Use administrative tools to examine the components of global directory.
96.04 Describe the global directory design, planning, and implementation processes.

97.0 Implement a global directory structure and domain structure - The student will be able to:

97.01 Create a forest and domain structure.
97.02 Configure DNS in a global directory environment.
97.03 Raise the functional level of a forest and a domain.
97.04 Create trust relationships between domains.
97.05 Secure trusts by using SID filtering.

98.0 Implement an organizational unit structure - The student will be able to:

98.01 Create an organizational unit.
98.02 Delegate control for an organizational unit.
98.03 Plan an organization unit strategy.

99.0 Implement user, group, and computer accounts - The student will be able to:

99.01 Describe the types of global directory accounts and groups.

99.02 Create multiple user and computer accounts.
99.03 Implement UPN suffixes.
99.04 Move objects within a domain and across domains in a global structure.
99.05 Plan a strategy for user computer and group accounts.
99.06 Plan a global directory audit strategy.

100.0 Implement group policy - The student will be able to:

100.01 Create and configure group policy objects.
100.02 Manage group policy objects.
100.03 Verify and troubleshoot group policies.
100.04 Delegate administrative control of group policies.
100.05 Plan a group policies strategy for the enterprise.

101.0 Deploy and manage software by using group policies - The student will be able to:

101.01 Explain the basic concepts of software deployment by using group policies.
101.02 Deploy software by using group policies.
101.03 Configure software deployment by using group policies.
101.04 Maintain deployed software by using group policies.
101.05 Troubleshoot some common problems with software deployment.
101.06 Plan a software deployment strategy.

102.0 Implement sites to manage global directory replication - The student will be able to:

102.01 Explain the components and the process of replication.
102.02 Create and configure sites.
102.03 Manage a global directory site topology.
102.04 Monitor and troubleshoot global directory replication failures.
102.05 Plan a site strategy**.**

103.0 Implement placement of domain controllers - The student will be able to:

103.01 Implement a global catalog in a global directory.
103.02 Determine the placement of domain controllers in a global directory.
103.03 Create a plan for placing domain controllers in a global directory.

104.0 Use a framework for designing security and create a security design team - The student will be able to:

104.01 Describe common elements of security policies and procedures.
104.02 Create a security design framework.
104.03 Create a security design team.

105.0 Recognize and predict common threats by using a threat model - The student will be able to:

105.01 Explain common network vulnerabilities and how attackers can exploit them.
105.02 Predict threats to security by using the STRIDE (Spoofing, Tampering, Repudiation, Information disclosure, Denial of service, and Elevation of privilege) threat model.

106.0 Apply a framework for planning risk management - The student will be able to:

106.01 Explain the purpose and operation of risk management.
106.02 Draft the elements of a risk management plan.

107.0 Design security for physical resources - The student will be able to:

107.01 Determine threats and analyze risks to physical resources.
107.02 Design security for physical resources.

108.0 Design security for computers - The student will be able to:

108.01 Determine threats and analyze risks to computers.
108.02 Design security for computers.

109.0 Design security for accounts - The student will be able to:

109.01 Determine threats and analyze risks to accounts.
109.02 Design security for accounts.

110.0 Design security for authentication - The student will be able to:

110.01 Determine threats and analyze risks to authentication.
110.02 Design security for authentication.

111.0 Design security for data - The student will be able to:

111.01 Determine threats and analyze risks to data.
111.02 Design security for data.

112.0 Design security for data transmission - The student will be able to:

112.01 Determine threats and analyze risks to data transmission.
112.02 Design security for data transmission**.**

113.0 Design security for network perimeters - The student will be able to:

113.01 Determine threats and analyze risks to network perimeters.
113.02 Design security for network perimeters**.**

114.0 Design an audit policy and an incident response procedure - The student will be able to:

114.01 Explain the importance of auditing and incident response.
114.02 Design an auditing policy.
114.03 Design an incident response procedure.

Course Number: CTS0029
Occupational Completion Point – F
Wireless Network Administrator – 150 Hours – SOC Code 15-1081

115.0 Participate in work-based learning experiences – The student will be able to:

115.01 Participate in work-based learning experiences in a network support services environment.
115.02 Discuss the use of technology in a network support services environment.
115.03 Discuss the management/supervisory skills needed in a network support service environment.

116.0 Demonstrate proficiency in applying radio frequency (RF) technologies - The student will be able to:

116.01 Define and apply the basic concepts of RF behavior.
116.02 Understand the applications of basic RF antenna concepts.
116.03 Understand and apply the basic components of RF
116.04 Identify some of the different uses for spread spectrum technologies.
116.05 Comprehend the differences between, and apply the different types of spread spectrum technologies.
116.06 Identify and apply the concepts which make up the functionality of spread spectrum technology.
116.07 Identify the laws set forth by the FCC that govern spread spectrum technology, including power outputs, frequencies, bandwidths, hop times, and dwell times.

117.0 Develop an awareness of wireless LAN technologies — The student will be able to:

117.01 Identify and apply the processes involved in authentication and association.
117.02 Recognize the concepts associated with wireless LAN service sets.
117.03 Understand the implications of the following power management features of wireless LANs.
117.04 Specify the modes of operation involved in the movement of data traffic across wireless LANs.

118.0 Perform implementation and management activities — The student will be able to:

118.01 Identify the technology roles for which wireless LAN technology is an appropriate technology application.
118.02 Identify the purpose of infrastructure devices and explain how to install, configure, and manage them.
118.03 Identify the purpose of wireless LAN client devices and explain how to install, configure, and manage them.
118.04 Identify the purpose of wireless LAN gateway devices and explain how to install, configure, and manage them.
118.05 Identify the basic attributes, purpose, and function of types of antennas.
118.06 Describe the proper locations and methods for installing antennas.
118.07 Explain the concepts of polarization, gain, beamwidth, and free-space path loss as they apply to implementing solutions that require antennas.
118.08 Identify the use of wireless LAN accessories and explain how to install, configure, and manage them.
118.09 Identify, understand, correct or compensate for wireless LAN implementation challenges.

118.10 Explain how antenna diversity compensates for multipath.
118.11 Identify and understand the importance and process of conducting a thorough site survey.
118.12 Identify and understand the importance of the necessary tasks involved in preparing to do an RF site survey.
118.13 Identify the necessary equipment involved in performing a site survey.
118.14 Understand the necessary procedures involved in performing a site survey.
118.15 Identify and understand site survey reporting procedures**.**

119.0 Develop an awareness of wireless security systems - The student will be able to:

119.01 Identify the strengths, weaknesses and appropriate uses of wireless LAN security techniques.
119.02 Describe types of wireless LAN security attacks, and explain how to identify and prevent them.
119.03 Given a wireless LAN scenario, identify the appropriate security solution from the following available wireless LAN security solutions.
119.04 Explain the uses of corporate security policies and how they are used to secure a wireless LAN.
119.05 Identify how and security precautions are used to secure a wireless LAN.

120.0 Demonstrate knowledge of wireless industry standards — The student will be able to:

120.01 Identify, apply and comprehend the differences between wireless LAN standards.
120.02 Understand the roles of organizations in providing direction and accountability within the wireless LAN industry.
120.03 Identify the differences between the ISM and UNII bands.
120.04 Identify and understand the differences between the power output rules for point-to-point and point-to-multipoint links.
120.05 Identify the basic characteristics of infrared wireless LANs.

Course Number: EEV0317
Occupational Completion Point – G
Data Communication Analyst – 150 Hours – SOC Code 15-1081

121.0 Participate in work-based learning experiences – The student will be able to:

121.01 Participate in work-based learning experiences in a network support services environment.
121.02 Discuss the use of technology in a network support services environment.
121.03 Discuss the management/supervisors skills needed in a network support services environment.

122.0 Demonstrate a knowledge of general security concepts — The student will be able to:

122.01 Describe access control.
122.02 Describe network authentication.
122.03 Understand the various types of network attacks (backdoors, DOS, spoofing, etc.)

122.04 Identify and modify non-essential services and protocols.
122.05 Identify malicious code (virus, worm, Trojan).
122.06 Configure system auditing, logging, and scanning as it relates to security procedures.

123.0 Develop an awareness of communication security concepts — The student will be able to:

123.01 Describe remote access protocols (VPN, RADIUS, L2TP, etc.).
123.02 Identify E-mail security concerns (hoaxes, spam, etc.).
123.03 Identify web (HTML) security concepts and designs (HTTP/S, IM, etc.).
123.04 Demonstrate an awareness of file transfer security concerns.
123.05 Describe and identify wireless networking security concerns and vulnerabilities.

124.0 Develop an awareness of network infrastructure security — The student will be able to:

124.01 Install and configure network firewalls.
124.02 Identify security concerns with various wiring media (copper, fiber).
124.03 Identify security concerns associated with removable media and storage devices.
124.04 Demonstrate an awareness of security topologies (security zones, Intranets, NAT, etc.).
124.05 Configure and use intrusion detection software.
124.06 Establish security baselines (updates, patches, hot fixes, Access Control lists, etc.).
124.07 Demonstrate the ability to configure a Virtual Private Network (VPN).
124.08 Describe the function of Network Address Translation (NAT**).**

125.0 Develop an awareness of cryptography and its relation to security — The student will be able to:

125.01 Demonstrate an understanding of security algorithms and encryption.
125.02 Use and apply Public Key Certificates.
125.03 Demonstrate an understanding of standards and protocols in commerce.

126.0 Incorporate organizational and operational security in an appropriate and effective manner — The student will be able to:

126.01 Describe how to establish a network security policy.
126.02 Explain the importance of physical security to protect network resources.
126.03 Identify and use disaster recovery procedures.
126.04 Describe the importance of business continuity and its relationship to network and corporate security.
126.05 Describe security policies and procedures that would be used in a business environment.
126.06 Explain the importance of privilege management (access, password management, sign-on, etc.).
126.07 Describe the concept of forensics as it applies to network security (obtaining evidence of security breaches).
126.08 Explain the importance of educating users and supervisors in regard to network security.

126.09 Create documentation that describes standards and guidelines for a network security system.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Keyboarding and Business Skills**
Course Number: **8200320**
Course Credit: **.5**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental word processing applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society.

This course, along with Computer and Business Skills is equivalent to Computing for College and Careers. Students should complete this course before enrolling in Computer and Business Skills.

10.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 10.01 Develop keyboarding skills to enter and manipulate text and data.
- 10.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 10.03 Demonstrate basic file management skills.

11.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 11.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 11.02 Write clear and well-organized research papers, integrating a variety of information.
- 11.03 Prepare and deliver an oral report with appropriate materials to the class
- 11.04 Participate in large group discussions as a member and/or a leader.
- 11.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 11.06 Accurately follow written and oral instructions.
- 11.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

12.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 12.01 Select and use word processing software and accompanying features to enhance written business communications.
- 12.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.

12.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

13.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

13.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
13.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
13.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

14.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

14.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
14.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

15.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

15.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
15.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
15.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

16.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

16.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
16.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.

16.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
16.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

17.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

17.01 Accept constructive criticism.
17.02 Apply appropriate strategies to manage and resolve conflict in work situations.
17.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

18.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
18.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer and Business Skills**
Course Number: **8200330**
Course Credit: **.5**

Course Description:

This course is designed to introduce students to the basic skills and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

This course, along with Keyboarding and Business Skills is equivalent to Computing for College and Careers. Students should complete Keyboarding and Business Skills before enrolling in this course.

14.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 14.01 Develop keyboarding skills to enter and manipulate text and data.
- 14.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 14.03 Identify and describe communications and networking systems used in workplace environments.
- 14.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 14.05 Demonstrate basic file management skills.
- 14.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
- 14.07 Describe ethical issues and problems associated with computers and information systems.
- 14.08 Apply ergonomic principles applicable to the configuration of computer workstations.

15.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

- 15.01 Take notes, organize, summarize, and paraphrase ideas and details.
- 15.02 Accurately follow written and oral instructions.
- 15.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

16.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

16.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
16.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
16.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

17.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

17.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
17.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

18.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
18.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
18.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

19.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

19.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
19.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
19.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

20.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

20.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
20.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

20.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

21.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

21.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
21.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
21.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
21.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
21.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
21.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
21.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
21.08 Build mentor relationships with local professionals in the industry.

22.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

22.01 Accept constructive criticism.
22.02 Apply appropriate strategies to manage and resolve conflict in work situations.
22.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

23.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

23.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

24.0 Perform e-mail activities. – The student will be able to:

24.01 Describe e-mail capabilities and functions.
24.02 Use the Internet to perform e-mail activities.

25.0 Demonstrate operating systems. – The student will be able to:

25.01 Identify operating system file naming conventions.

25.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
25.03 Demonstrate a working knowledge of standard file formats.
25.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

26.0 Develop an awareness of emerging technologies. – The student will be able to:

26.01 Compare and contrast various methods of evaluation for emerging technologies.
26.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
26.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computing for College and Careers**
Course Number: **8209020**
Course Credit: **1**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society. This also includes proficiency with computers using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance-The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Demonstrate basic computer file management skills.
- 01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.07 Describe ethical issues and problems associated with computers and information systems.
- 01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills — The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.

02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles — The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace — The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance — The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance — The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.

07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals — The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals — The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace — The student will be able to:

10.01 Accept constructive criticism.
10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences — The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities – The student will be able to:

12.01 Describe e-mail capabilities and functions.

12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.
12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.
12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using HTML commands – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).

15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the WWW – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software - The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry - The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers - The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages - The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies - The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model - The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications - The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications - The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Networking 1**
Course Number: **8207020**
Course Credit: **1**

Course Description:

This course is designed to develop competencies needed for employment in network support positions. The content includes instruction in basic hardware configuration, hardware and software troubleshooting, operating systems, and computer networking.

25.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance - The student will be able to:

25.01 Develop strategies for resolving customer conflicts.

26.0 Identify, install, configure, and upgrade desktop and server computer modules and peripherals, following established basic procedures for system assembly and disassembly of field replaceable modules - The student will be able to:

26.01 Identify and describe the functions of main processing boards (e.g., CPUs, RAM, ROM, bus architecture).
26.02 Identify and describe the functions of communication ports (e.g., serial and parallel ports).
26.03 Identify and describe the functions of peripheral devices (e.g., scanners, modems, hard drives, printers.
26.04 Identify and describe the components of portable systems (e.g., battery, LCD, AC adapter, PDAs).
26.05 Troubleshoot, install and upgrade computers and peripherals.
26.06 Perform system hardware setup Demonstrate an understanding of input/output devices.
26.07 Installation and configuration of applications software, hardware, and device drivers.
26.08 Demonstrate an understanding of the operation and purpose of hardware components.
26.09 Install operating system software.
26.10 Customize operating systems.
26.11 Install application software.
26.12 Perform storage formatting and preparation activities.
26.13 Identify data measurement (e.g., bits, bytes, kilobytes).
26.14 Install and Configure RAID.
26.15 Recognize and report on server room environmental issues (temperature, humidity/ESD/power surges, back-up).

27.0 Diagnose and troubleshoot common module problems and system malfunctions of computer software, hardware, peripherals, and other office equipment - The student will be able to:

27.01 Troubleshoot a personal computer system
27.02 Identify configuration problems.
27.03 Identify software problems.
27.04 Identify hardware malfunctions.
27.05 Identify network malfunctions
27.06 Resolve computer error messages.
27.07 Understand and troubleshoot memory and cache systems.
27.08 Verify that drives are the appropriate type.
27.09 Describe knowledge database search procedures used to identify possible solutions when troubleshooting software and hardware problems.

28.0 Identify issues, procedures and devices for protection within the computing environment, including people, hardware and the surrounding workspace - The student will be able to:

28.01 Apply basic rules for hardware safety.
28.02 Demonstrate proficiency in basic preventative hardware maintenance.
28.03 Special disposal procedures that comply with environmental guidelines for batteries, CRTs, toner kits/cartridges, chemical solvents and cans, and MSDS.
28.04 Apply ergonomic principles applicable to the configuration of computer workstations.
28.05 Describe ethical issues and problems associated with computers and information systems**.**

29.0 Identify specific terminology, facts, ways and means of dealing with classifications, categories and principles of motherboards, processors and memory in desktop and server computer systems — The student will be able to:

29.01 Identify EDO RAM, DRAM, SRAM, RIMM, VRAM, SDRAM, and WRAM.
29.02 Identify memory banks, memory chips (8-bit, 16-bit, and 32-bit), SIMMS (Single In-line Memory Module), DIMMS (Dual In-line Memory Module), parity chips versus non-parity chips.
29.03 Identify printer parallel port, COM/serial port, floppy drive, hard drive, Memory, and Boot sequence.

30.0 Demonstrate knowledge of basic types of printers, basic concepts, printer components, how they work, how they print onto a page, paper path, care and service techniques, and common problems - The student will be able to:

30.01 Identify types of printers—Laser, Inkjet, Dot Matrix.
30.02 Identify care and service techniques and common problems with primary printer types.
30.03 Implement and manage printing on a network.

31.0 Identify and describe basic network concepts and terminology, ability to determine whether a computer is networked, knowledge of procedures for swapping and

configuring network interface cards, and knowledge of the ramifications of repairs when a computer is networked - The student will be able to:

31.01 Define networking and describe the purpose of a network.
31.02 Identify the purposes and interrelationships among the major components of networks (e.g., servers, clients, transmission media, network operating system, network boards).
31.03 Describe the various types of network topologies.
31.04 Identify and describe the purpose of standards, protocols, and the Open Systems Interconnection (OSI) reference model.
31.05 Configure network and verify network connectivity.
31.06 Discuss the responsibilities of the network administrator (e.g., rights and responsibilities).
31.07 Develop user logon procedures.
31.08 Utilize network management infrastructures (e.g., network monitoring, alerting, security) to perform administrative tasks.
31.09 Identify common backup strategies and procedures.
31.10 Select and use appropriate electronic communications software and hardware for specific tasks.
31.11 Compare and contrast Internet software and protocols.
31.12 Diagnose and resolve electronic communications operational problems.
31.13 Design and implement directory tree structures.
31.14 Install services tools (SNMP, backup software)
31.15 Perform full backup and verify backup
31.16 Identify bottlenecks (e.g., processor, bus transfer, I/O, disk I/O, network I/O, memory).
31.17 Use the concepts of fault tolerance/fault recovery to create a disaster recovery plan.
31.18 Document and test disaster recovery plan regularly, and update as needed.

32.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, internet, remote access, or direct contact - The student will be able to:

32.01 Apply call center vocabulary.
32.02 Listen and input information simultaneously.
32.03 Apply first response assistance for minor repair work.

33.0 Demonstrate proficiency using graphical user interface (GUI) operating systems - The student will be able to:

33.01 Identify parts of GUI windows.
33.02 Create and use icons.
33.03 Demonstrate proficiency in using menu systems.
33.04 Demonstrate proficiency in using pointing and selection devices.
33.05 Identify keyboard shortcuts and special function keys.
33.06 Demonstrate proficiency in manipulating windows.
33.07 Utilize help systems and hypertext links.
33.08 Create, organize, and maintain file system directories.
33.09 Organize desktop objects.
33.10 Run multiple applications.

127.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

127.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
127.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
127.03 Present information formally and informally for specific purposes and audiences. AF2.9

128.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

128.01 Demonstrate knowledge of arithmetic operations. AF3.2
128.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
128.03 Construct charts/tables/graphs using functions and data. AF3.5

129.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

129.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
129.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Networking 2, Administration**
Course Number: **8207441**
Course Credit: **1**

Course Description:

This course is designed to provide individuals with the knowledge necessary to understand and identify the tasks involved in supporting operating system within a large networking environment.

34.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance - The student will be able to:

34.01 Develop diplomatic methods to communicate with customers.

35.0 Participate in work-based learning experiences - The student will be able to:

35.01 Participate in work-based learning experiences in a network support services environment.
35.02 Discuss the use of technology in a network environment.

36.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, remote access, or direct contact - The student will be able to:

36.01 Apply first response assistance for minor repair work.

37.0 Perform installation and configuration activities - The student will be able to:

37.01 Configure the operating system environment.
37.02 Connect client workstation running similar operating system to the network.
37.03 Configure Internet access for a network.
37.04 Configure a Web server.
37.05 Use remote server to deploy operating system.
37.06 Troubleshoot failed installations.
37.07 Install and configure network services for interoperability.
37.08 Monitor, configure troubleshoot and control access to printers.
37.09 Monitor, configure troubleshoot and control access to files, folders, and shared folders.
37.10 Monitor, configure troubleshoot and control access to Web sites.

38.0 Demonstrate proficiency using computer networks - The student will be able to:

38.01 Identify and describe the purpose of standards, protocols, and the Open Systems Interconnection (OSI) reference model.

39.0 Demonstrate proficiency in configuring and troubleshooting hardware devices and drivers - The student will be able to:

39.01 Configure hardware devices.
39.02 Configure driver signing options.
39.03 Update device drivers.
39.04 Troubleshoot problems with hardware.

40.0 Demonstrate proficiency in managing, monitoring, and optimizing system performance, reliability and availability - The student will be able to:

40.01 Monitor and optimize usage of system resources.
40.02 Manage processes.
40.03 Optimize disk performance.
40.04 Manage and optimize availability of system data and user data.
40.05 Recover systems and user data.

41.0 Demonstrate proficiency in managing, configuring and troubleshooting storage use – The student will be able to:

41.01 Configure and manage user profiles.
41.02 Monitor, configure and troubleshoot disks and volumes.
41.03 Configure data compression.
41.04 Monitor and configure disk quotas.
41.05 Recover from disk failures.

42.0 Demonstrate proficiency in configuring and troubleshooting network connections - The student will be able to:

42.01 Install, configure and troubleshoot shared access.
42.02 Install, configure and troubleshoot a virtual private network.
42.03 Install, configure and troubleshoot network protocols.
42.04 Install and configure network services.
42.05 Configure, monitor and troubleshoot remote access.
42.06 Install, configure, monitor, and troubleshoot Terminal Services.
42.07 Configure the properties of a connection.
42.08 Install, configure, and troubleshoot network adapters and drivers.

43.0 Demonstrate proficiency in implementing, monitoring, and troubleshooting security - The student will be able to:

43.01 Encrypt data on a hard disk by using Encrypting File System.
43.02 Implement, configure, manage and troubleshoot policies in an operating system environment.
43.03 Implement, configure, manage and troubleshoot auditing.
43.04 Implement, configure, manage and troubleshoot local accounts.
43.05 Implement, configure, manage and troubleshoot account policy.
43.06 Implement, configure, manage and troubleshoot security by using the Security Configuration Tool Set.

130.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

130.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
130.02 Locate, organize and reference written information from various sources. CM 3.0
130.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
130.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
130.05 Apply active listening skills to obtain and clarify information. CM 7.0
130.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
130.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

131.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

131.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
131.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
131.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
131.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

132.0 Use information technology tools. – The student will be able to:

132.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
132.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
132.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
132.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

133.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

133.01 Describe the nature and types of business organizations. SY 1.0
133.02 Explain the effect of key organizational systems on performance and quality.
133.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
133.04 Explain the impact of the global economy on business organizations.

136.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

136.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
136.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1

136.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2

136.04 Interpret and explain written organizational policies and procedures. ELR 2.0

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Networking 3, Administration**
Course Number: **8207442**
Course Credit: **1**

Course Description:

This course continues the study of network support services. The content includes the planning, implementation, and management of server and client operating systems in a networking environment.

44.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance - The student will be able to:

- 44.01 Develop diplomatic methods to communicate with customers, clients, and end-users of information technology services.

45.0 Participate in work-based learning experiences – The student will be able to:

- 45.01 Participate in work-based learning experiences in a network support services environment.
- 45.02 Discuss the use of technology in a network support services environment.
- 45.03 Discuss the management/supervisors skills needed in a network support services environment.

46.0 Administer accounts and resources on computers running server operating system software in a networked environment - The student will be able to:

- 46.01 Describe features of server operating system.
- 46.02 Log on to the server operating system.
- 46.03 Install and configure administrative tools.
- 46.04 Create user accounts.
- 46.05 Create computer accounts.
- 46.06 Create an organizational unit.

47.0 Modify user and computer accounts on computers running a server operating system in a networked environment - The student will be able to:

- 47.01 Modify user and computer account properties.
- 47.02 Enable and unlock user and computer accounts.
- 47.03 Create a user account template.
- 47.04 Locate user and computer accounts in a global directory structure.
- 47.05 Save queries.
- 47.06 Reset user and computer accounts.
- 47.07 Move domain objects**.**

48.0 Perform various administrative functions using groups - The student will be able to:

48.01 Create groups.
48.02 Manage group membership
48.03 Apply strategies for using groups
48.04 Modify groups.
48.05 Manage default groups**.**

49.0 Enable resource access with permissions, manage access to files and folders using permissions, and manage permission inheritance - The student will be able to:

49.01 Manage access to resources.
49.02 Manage access to shared folders.
49.03 Manage access to files and folders by using file system permissions.
49.04 Determine effective permissions.
49.05 Manage access to shared files by using offline caching.

50.0 Implement printing in a networked environment utilizing a particular server operating system - The student will be able to:

50.01 Install and share printers.
50.02 Manage access to printers by using shared printer permissions.
50.03 Manage printer drivers.
50.04 Implement printer locations.

51.0 Set up a network-wide printing strategy to meet the needs of users and troubleshoot installation or configuration problems - The student will be able to:

51.01 Change the location of the print spooler.
51.02 Set printing priorities.
51.03 Schedule printer availability.
51.04 Configure a printing tool**.**

52.0 Utilize available permissions for managing access to global directory objects, how to move objects between organizational units in the same domain, and how to delegate control of an organizational unit - The student will be able to:

52.01 Identify the role of organizational units.
52.02 Modify permissions for global directory objects.
52.03 Delegate control of organizational units.

53.0 Use group policy to configure folder redirection, browser connectivity, and the desktop - The student will be able to:

53.01 Configure group policy settings.
53.02 Assign scripts with group policy.
53.03 Configure folder redirection.

54.0 Manage computer security in a security in a networking environment - The student will be able to:

54.01 Describe the security features a server operating system.

54.02 Use security templates to secure computers.
54.03 Test computer security policy.
54.04 Configure auditing.
54.05 Manage security logs.

55.0 Administer servers remotely - The student will be able to:

55.01 Explain the tasks, tools, and rights that are required to administer a server.
55.02 Configure remote access for administration and client preferences.
55.03 Manage remote desktop connections.

56.0 Monitor server performance by using performance tools, configure and manage performance logs, configure and manage alerts, and manage system monitor views - The student will be able to:

56.01 Establish a performance baseline.
56.02 Perform real-time and logged monitoring.
56.03 Configure and manage counter logs.
56.04 Configure alerts**.**

57.0 Collect performance data by monitoring primary server subsystems and identify system bottlenecks by using the performance monitoring software - The student will be able to:

57.01 Explain how the four primary server subsystems affect server performance.
57.02 Monitor server memory.
57.03 Monitor processor usage.
57.04 Monitor disks.
57.05 Monitor network usage.
57.06 Identify the guidelines for using counters and thresholds.
57.07 Describe the best practices for monitoring server performance.

58.0 Maintaining device drivers - The student will be able to:

58.01 Configure device driver signing.
58.02 Restore the previous version of a device driver.

59.0 Use software tools to manage and set up disks - The student will be able to:

59.01 Initialize and partition a disk.
59.02 View and update disk properties.
59.03 Manage mounted drives.
59.04 Create volumes on a disk.
59.05 Convert a disk from basic to dynamic and from dynamic to basic.
59.06 Import disks.

60.0 Use file encryption for security of data - The student will be able to:

60.01 Manage disk based file compression.
60.02 Configure file encryption.
60.03 Implement disk quotas.

61.0 Plan for a computer disaster and use the features of a server operating system to prevent a disaster or recover when one occurs - The student will be able to:

61.01 Prepare for disaster recovery.
61.02 Back up data.
61.03 Schedule backup jobs.
61.04 Restore data.
61.05 Configure a shadow copy.
61.06 Recover from server failure.
61.07 Select a disaster recovery method**.**

62.0 Manage and distribute critical software updates that resolve known security vulnerabilities and other stability issues - The student will be able to:

62.01 Install and configure client computers to use receive software updates.
62.02 Install and configure servers to use perform software updates.
62.03 Manage the Software Update Services infrastructure**.**

63.0 Construct and assign IP addresses and isolate addressing issues associated with the ip routing process - The student will be able to:

63.01 Convert IP Addresses from decimal to binary.
63.02 Calculate a subnet mask.
63.03 Create subnets using VLSM and CIDR.
63.04 Isolate addressing issues associated with the IP routing process.

64.0 Configure an internet protocol (IP) address for client computers - The student will be able to:

64.01 Configure a client to use a static IP address.
64.02 Configure a client to obtain an IP address automatically by using DHCP.
64.03 Configure a client to obtain an IP address automatically by using Alternate Configuration.

65.0 Configure name resolution mechanisms for clients on a network and describe the name resolution process - The student will be able to:

65.01 Use ARP to identify client media access control (MAC) addresses.
65.02 Describe the function of Network Basic Input/Output System (NetBIOS).
65.03 Configure a client to use a static IP address.
65.04 Configure a client to use name resolution servers.

66.0 Isolate common connectivity issues and describe how to use utilities and tools as part of this process - The student will be able to:

66.01 Isolate common connectivity issues.
66.02 Use a flow chart to isolate a problem.
66.03 Use utilities and tools to isolate a problem

67.0 Configure a routing solution for a network environment - The student will be able to:

67.01 Describe the role of routing in the network infrastructure.
67.02 Enable and configure the Routing and Remote Access service.
67.03 Configure packet filters**.**

68.0 Allocate IP addressing in a network environment - The student will be able to:

68.01 Describe the role of DHCP in the network infrastructure.
68.02 Add and authorize a DHCP Server service.
68.03 Configure a DHCP scope.
68.04 Configure DHCP options.
68.05 Configure a DHCP reservation.
68.06 Configure a DHCP relay agent.

69.0 Manage the DHCP service to reflect changing client IP addressing needs and monitor DHCP server performance - The student will be able to:

69.01 Manage a DHCP database.
69.02 Monitor DHCP.
69.03 Apply security guidelines for DHCP.

70.0 Assign computer names to the IP addresses of the source and destination hosts, and then use the computer name to contact the hosts - The student will be able to:

70.01 Describe the name resolution process.
70.02 View names on a client.
70.03 Configure host name resolution.

71.0 Resolve host names by using domain name system - The student will be able to:

71.01 Describe the role of DNS in the network infrastructure.
71.02 Install the DNS Server service.
71.03 Configure the properties for the DNS Server service.
71.04 Configure the DNS zones.
71.05 Configure DNS zone transfers.
71.06 Configure dynamic updates.
71.07 Configure a DNS client.
71.08 Delegate authority for zones**.**

72.0 Manage and monitor DNS servers to ensure that they are functioning properly and to optimize network performance - The student will be able to:

72.01 Configure the Time-to-Live (TTL) value.
72.02 Configure aging and scavenging.
72.03 Integrate DNS with WINS.
72.04 Test the DNS server configuration.
72.05 Monitor DNS server performance.

73.0 Configure a server with the routing and remote access service, create appropriate remote access connections on a network access server, and configure users' access rights - The student will be able to:

73.01 Describe a network access infrastructure.
73.02 Configure a virtual private network (VPN) connection.
73.03 Configure a dial-up connection.
73.04 Configure a wireless connection.
73.05 Control remote user access to a network.
73.06 Centralize authentication and policy management for network access by using Internet Authentication Service (IAS).

74.0 Manage and monitor network access and the network access services - The student will be able to:

74.01 Configure logging on the network access server.
74.02 Collect and monitor network access data.

75.0 Perform installation of a network client operating system - The student will be able to:

75.01 Plan a client operating system installation.
75.02 Install a client operating system.
75.03 Upgrade a client operating system from an earlier version.
75.04 Automate the installation process for a client operating system.

76.0 Install and configure hardware devices - The student will be able to:

76.01 Configure hardware devices and drivers on a computer running a client OS.
76.02 Add and remove devices by using built in utilities and wizards
76.03 Restore device drivers.

77.0 Configure and manage file systems - The student will be able to:

77.01 Work with file systems.
77.02 Manage data compression.
77.03 Secure data by using EFS.
77.04 Configure disk compression.
77.05 Secure files by using EFS.

78.0 Troubleshoot the boot process and other system issues - The student will be able to:

78.01 Examine the boot process.
78.02 Control system settings during the boot process.
78.03 Change startup behavior.
78.04 Use advanced boot options to troubleshoot startup problems.
78.05 Restore a computer to a previous state.
78.06 Troubleshoot the boot process and other system issues.

79.0 Configure the desktop - The student will be able to:

79.01 Configure user desktop settings.
79.02 Customize the desktop environment.
79.03 Configure system settings.
79.04 Describe how user profiles and group policy affect desktop customization.

80.0 Configure IP addresses and name resolution - The student will be able to:

80.01 Configure IP addresses.
80.02 Troubleshoot IP addresses.
80.03 Determine TCP/IP name resolution methods.
80.04 Configure a DNS and WINS client.
80.05 Connect to a remote host.
80.06 Configure IP addresses.
80.07 Configure the DNS client**.**

81.0 Configure the client to work in a network environment - The student will be able to:

81.01 Examine workgroups and user accounts.
81.02 Create and authenticate local user accounts.
81.03 Configure local security.
81.04 Configure logon options.
81.05 Configure networking.
81.06 Join a domain.
81.07 Operate in a domain**.**

82.0 Support remote users - The student will be able to:

82.01 Establish remote access connections.
82.02 Connect to Virtual Private Networks.
82.03 Configure inbound connections.
82.04 Configure authentication protocols and encryption.
82.05 Using remote desktop.
82.06 Store user names and passwords to facilitate remote connections.
82.07 Configure a VPN connection.
82.08 Configure and using remote desktop.
82.09 Store user names and passwords**.**

83.0 Configure a client OS for mobile computing - The student will be able to:

83.01 Configure hardware for mobile computing.
83.02 Configure power management options for mobile computing.
83.03 Make files, folders, and web pages available for offline use.

84.0 Monitor resources and performance - The student will be able to:

84.01 Determine system information.
84.02 Use task manager to monitor system performance.
84.03 Use performance and maintenance tools to improve performance.
84.04 Monitor event logs.
84.05 Configure program compatibility.

134.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

134.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
134.02 Explain emergency procedures to follow in response to workplace accidents.
134.03 Create a disaster and/or emergency response plan. SHE 2.0

135.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

135.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
135.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
135.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
135.04 Employ mentoring skills to inspire and teach others. LT 5.0

137.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

137.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
137.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
137.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
137.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
137.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
137.06 Identify and exhibit traits for retaining employment. ECD 7.0
137.07 Identify opportunities and research requirements for career advancement. ECD 8.0
137.08 Research the benefits of ongoing professional development. ECD 9.0
137.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

138.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

138.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
138.02 Describe the effect of money management on personal and career goals. FL 3.0
138.03 Develop a personal budget and financial goals. FL3.1
138.04 Complete financial instruments for making deposits and withdrawals. FL3.2
138.05 Maintain financial records. FL3.3
138.06 Read and reconcile financial statements. FL3.4
138.07 Research, compare and contrast investment opportunities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Networking 4, Administration**
Course Number: **8207443**
Course Credit: **1**

Course Description:

This course continues the study of network support services. The content includes the planning, implementation, and management of server and client operating systems in a networking environment.

85.0 Apply communication skills (reading, writing, speaking, listening, and viewing) in a courteous, concise, and correct manner on personal and professional levels - The student will be able to:

- 85.01 Communicate technical information in a concise, understandable manner to a non-technical audience both verbally and in writing.

86.0 Participate in work-based learning experiences - The student will be able to:

- 86.01 Participate in work-based learning experiences in a network support services environment.
- 86.02 Discuss the use of technology in a network support services environment.
- 86.03 Compare and contrast the software applications used in a network support services environment.

87.0 Plan a network infrastructure - The student will be able to:

- 87.01 Explain how to plan a network.
- 87.02 Explain how to prepare development and test environments.
- 87.03 Explain the concepts of managing and maintaining a network environment by using specific tools.
- 87.04 Explain the technologies and services implemented in a network.

88.0 Plan and optimize a TCP/IP physical and logical network - The student will be able to:

- 88.01 Discuss TCP/IP.
- 88.02 Plan a TCP/IP addressing scheme.
- 88.03 Optimize network performance**.**

89.0 Plan and troubleshoot routing - The student will be able to:

- 89.01 Describe how routing works.
- 89.02 Create a secure routing plan.
- 89.03 Identify TCP/IP routing trouble shooting tools.
- 89.04 Troubleshoot TCP/IP routing**.**

90.0 Plan a DHCP strategy - The student will be able to:

90.01 Demonstrate how DHCP operates in an enterprise environment.
90.02 Plan a DHCP strategy.
90.03 Secure a DHCP strategy.

91.0 Plan a DNS strategy - The student will be able to:

91.01 Plan a namespace strategy.
91.02 Plan zones.
91.03 Plan zone replication.
91.04 Plan a DNS server implementation.

92.0 Optimize and troubleshoot DNS - The student will be able to:

92.01 Optimize a DNS server.
92.02 Optimize the DNS server-to-server communications.
92.03 Optimize DNS client support traffic.
92.04 Troubleshoot host name resolution.

93.0 Plan and troubleshoot IPSEC - The student will be able to:

93.01 Discuss IPSec.
93.02 Understand IPSec default policies, rules, and settings.
93.03 Plan IPSec deployment.
93.04 Troubleshoot IPSec.

94.0 Plan a network access - The student will be able to:

94.01 Select appropriate connection methods for a network access strategy.
94.02 Select a remote access policy strategy.
94.03 Select a network access authentication method.
94.04 Plan a network access strategy.

95.0 Troubleshoot network access - The student will be able to:

95.01 Identify network access troubleshooting resources.
95.02 Troubleshoot network authentication.
95.03 Troubleshoot LAN authentication.
95.04 Troubleshoot remote access.

96.0 Analyze global director infrastructure - The student will be able to:

96.01 Describe the architecture of global directory.
96.02 Describe the working of global directory.
96.03 Use administrative tools to examine the components of global directory.
96.04 Describe the global directory design, planning, and implementation processes.

97.0 Implement a global directory structure and domain structure - The student will be able to:

97.01 Create a forest and domain structure.
97.02 Configure DNS in a global directory environment.

97.03 Raise the functional level of a forest and a domain.
97.04 Create trust relationships between domains.
97.05 Secure trusts by using SID filtering.

98.0 Implement an organizational unit structure - The student will be able to:

98.01 Create an organizational unit.
98.02 Delegate control for an organizational unit.
98.03 Plan an organization unit strategy.

99.0 Implement user, group, and computer accounts - The student will be able to:

99.01 Describe the types of global directory accounts and groups.
99.02 Create multiple user and computer accounts.
99.03 Implement UPN suffixes.
99.04 Move objects within a domain and across domains in a global structure.
99.05 Plan a strategy for user computer and group accounts.
99.06 Plan a global directory audit strategy.

100.0 Implement group policy - The student will be able to:

100.01 Create and configure group policy objects.
100.02 Manage group policy objects.
100.03 Verify and troubleshoot group policies.
100.04 Delegate administrative control of group policies.
100.05 Plan a group policies strategy for the enterprise.

101.0 Deploy and manage software by using group policies - The student will be able to:

101.01 Explain the basic concepts of software deployment by using group policies.
101.02 Deploy software by using group policies.
101.03 Configure software deployment by using group policies.
101.04 Maintain deployed software by using group policies.
101.05 Troubleshoot some common problems with software deployment.
101.06 Plan a software deployment strategy**.**

102.0 Implement sites to manage global directory replication - The student will be able to:

102.01 Explain the components and the process of replication.
102.02 Create and configure sites.
102.03 Manage a global directory site topology.
102.04 Monitor and troubleshoot global directory replication failures.
102.05 Plan a site strategy.

103.0 Implement placement of domain controllers - The student will be able to:

103.01 Implement a global catalog in a global directory.
103.02 Determine the placement of domain controllers in a global directory.
103.03 Create a plan for placing domain controllers in a global directory.

104.0 Use a framework for designing security and create a security design team - The student will be able to:

104.01 Describe common elements of security policies and procedures.
104.02 Create a security design framework.
104.03 Create a security design team.

105.0 Recognize and predict common threats by using a threat model - The student will be able to:

105.01 Explain common network vulnerabilities and how attackers can exploit them.
105.02 Predict threats to security by using the STRIDE (Spoofing, Tampering, Repudiation, Information disclosure, Denial of service, and Elevation of privilege) threat model.

106.0 Apply a framework for planning risk management - The student will be able to:

106.01 Explain the purpose and operation of risk management.
106.02 Draft the elements of a risk management plan.

107.0 Design security for physical resources - The student will be able to:

107.01 Determine threats and analyze risks to physical resources.
107.02 Design security for physical resources.

108.0 Design security for computers - The student will be able to:

108.01 Determine threats and analyze risks to computers.
108.02 Design security for computers.

109.0 Design security for accounts - The student will be able to:

109.01 Determine threats and analyze risks to accounts.
109.02 Design security for accounts.

110.0 Design security for authentication - The student will be able to:

110.01 Determine threats and analyze risks to authentication.
110.02 Design security for authentication.

111.0 Design security for data - The student will be able to:

111.01 Determine threats and analyze risks to data.
111.02 Design security for data.

112.0 Design security for data transmission - The student will be able to:

112.01 Determine threats and analyze risks to data transmission.
112.02 Design security for data transmission.

113.0 Design security for network perimeters - The student will be able to:

113.01 Determine threats and analyze risks to network perimeters.
113.02 Design security for network perimeters.

114.0 Design an audit policy and an incident response procedure - The student will be able to:

114.01 Explain the importance of auditing and incident response.
114.02 Design an auditing policy.
114.03 Design an incident response procedure.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Networking 5**
Course Number: **8207060**
Course Credit: **1**

Course Description:

This course continues the study of network support services. The content includes wireless networking technologies, implementation, management and security.

115.0 Participate in work-based learning experiences – The student will be able to:

115.01 Participate in work-based learning experiences in a network support services environment.
115.02 Discuss the use of technology in a network support services environment.
115.03 Discuss the management/supervisory skills needed in a network support service environment.

116.0 Demonstrate proficiency in applying radio frequency (RF) technologies - The student will be able to:

116.01 Define and apply the basic concepts of RF behavior.
116.02 Understand the applications of basic RF antenna concepts.
116.03 Understand and apply the basic components of RF
116.04 Identify some of the different uses for spread spectrum technologies.
116.05 Comprehend the differences between, and apply the different types of spread spectrum technologies.
116.06 Identify and apply the concepts which make up the functionality of spread spectrum technology.
116.07 Identify the laws set forth by the FCC that govern spread spectrum technology, including power outputs, frequencies, bandwidths, hop times, and dwell times.

117.0 Develop an awareness of wireless LAN technologies - The student will be able to:

117.01 Identify and apply the processes involved in authentication and association.
117.02 Recognize the concepts associated with wireless LAN service sets.
117.03 Understand the implications of the following power management features of wireless LANs.
117.04 Specify the modes of operation involved in the movement of data traffic across wireless LANs.

118.0 Perform implementation and management activities - The student will be able to:

118.01 Identify the technology roles for which wireless LAN technology is an appropriate technology application.
118.02 Identify the purpose of infrastructure devices and explain how to install, configure, and manage them.

118.03 Identify the purpose of wireless LAN client devices and explain how to install, configure, and manage them.
118.04 Identify the purpose of wireless LAN gateway devices and explain how to install, configure, and manage them.
118.05 Identify the basic attributes, purpose, and function of types of antennas.
118.06 Describe the proper locations and methods for installing antennas.
118.07 Explain the concepts of polarization, gain, beamwidth, and free-space path loss as they apply to implementing solutions that require antennas.
118.08 Identify the use of wireless LAN accessories and explain how to install, configure, and manage them.
118.09 Identify, understand, correct or compensate for wireless LAN implementation challenges.
118.10 Explain how antenna diversity compensates for multipath.
118.11 Identify and understand the importance and process of conducting a thorough site survey.
118.12 Identify and understand the importance of the necessary tasks involved in preparing to do an RF site survey.
118.13 Identify the necessary equipment involved in performing a site survey.
118.14 Understand the necessary procedures involved in performing a site survey.
118.15 Identify and understand site survey reporting procedures**.**

119.0 Develop an awareness of wireless security systems - The student will be able to:

119.01 Identify the strengths, weaknesses and appropriate uses of wireless LAN security techniques.
119.02 Describe types of wireless LAN security attacks, and explain how to identify and prevent them.
119.03 Given a wireless LAN scenario, identify the appropriate security solution from the following available wireless LAN security solutions.
119.04 Explain the uses of corporate security policies and how they are used to secure a wireless LAN.
119.05 Identify how and security precautions are used to secure a wireless LAN.

120.0 Demonstrate knowledge of wireless industry standards - The student will be able to:

120.01 Identify, apply and comprehend the differences between wireless LAN standards.
120.02 Understand the roles of organizations in providing direction and accountability within the wireless LAN industry.
120.03 Identify the differences between the ISM and UNII bands.
120.04 Identify and understand the differences between the power output rules for point-to-point and point-to-multipoint links.
120.05 Identify the basic characteristics of infrared wireless LANs.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Networking 6**
Course Number: **8207070**
Course Credit: **1**

Course Description:

This course continues the study of network support services. The content includes network security.

121.0 Participate in work-based learning experiences – The student will be able to:

- 121.01 Participate in work-based learning experiences in a network support services environment.
- 121.02 Discuss the use of technology in a network support services environment.
- 121.03 Discuss the management/supervisors skills needed in a network support services environment.

122.0 Demonstrate a knowledge of general security concepts - The student will be able to:

- 122.01 Describe access control.
- 122.02 Describe network authentication.
- 122.03 Understand the various types of network attacks (backdoors, DOS, spoofing, etc.)
- 122.04 Identify and modify non-essential services and protocols.
- 122.05 Identify malicious code (virus, worm, Trojan).
- 122.06 Configure system auditing, logging, and scanning as it relates to security procedures.

123.0 Develop an awareness of communication security concepts - The student will be able to:

- 123.01 Describe remote access protocols (VPN, RADIUS, L2TP, etc.).
- 123.02 Identify E-mail security concerns (hoaxes, spam, etc.).
- 123.03 Identify web (HTML) security concepts and designs (HTTP/S, IM, etc.).
- 123.04 Demonstrate an awareness of file transfer security concerns.
- 123.05 Describe and identify wireless networking security concerns and vulnerabilities.

124.0 Develop an awareness of network infrastructure security - The student will be able to:

- 124.01 Install and configure network firewalls.
- 124.02 Identify security concerns with various wiring media (copper, fiber).
- 124.03 Identify security concerns associated with removable media and storage devices.
- 124.04 Demonstrate an awareness of security topologies (security zones, Intranets, NAT, etc.).
- 124.05 Configure and use intrusion detection software.
- 124.06 Establish security baselines (updates, patches, hot fixes, Access Control lists, etc.).
- 124.07 Demonstrate the ability to configure a Virtual Private Network (VPN).

124.08 Describe the function of Network Address Translation (NAT**).**

125.0 Develop an awareness of cryptography and its relation to security - The student will be able to:

125.01 Demonstrate an understanding of security algorithms and encryption.
125.02 Use and apply Public Key Certificates.
125.03 Demonstrate an understanding of standards and protocols in commerce.

126.0 Incorporate organizational and operational security in an appropriate and effective manner - The student will be able to:

126.01 Describe how to establish a network security policy.
126.02 Explain the importance of physical security to protect network resources.
126.03 Identify and use disaster recovery procedures.
126.04 Describe the importance of business continuity and its relationship to network and corporate security.
126.05 Describe security policies and procedures that would be used in a business environment.
126.06 Explain the importance of privilege management (access, password management, sign-on, etc.).
126.07 Describe the concept of forensics as it applies to network security (obtaining evidence of security breaches).
126.08 Explain the importance of educating users and supervisors in regard to network security.
126.09 Create documentation that describes standards and guidelines for a network security system.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Web Design**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	8207500	B070500
CIP Number	0507.039905	0507.039905
Grade Level	9-12, 30, 31	30, 31
Standard Length	7 credits	1050 hours
Teacher Certification	BUS ED 1 @2 VOE @7 TEACH CBE @7 BUS DP @7 G ELECT DP @7 G CLERICAL @7 G SECRETAR @7 G STENOG @4 TEC ELEC $7 G COMPU SCI 6 COMM ART @7 G	BUS ED 1 @2 VOE @7 TEACH CBE @7 BUS DP @7 G ELECT DP @7 G CLERICAL @7 G SECRETAR @7 G STENOG @4 TEC ELEC $7 G COMPU SCI 6 COMM ART @7
CTSO	FBLA BPA	Phi Beta Lambda BPA
SOC Codes (all applicable)	15-1041; 15-1099.04	15-1041; 15-1099.04
Facility Code	[212] http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	Mathematics: 9.0 Language: 9.0 Reading: 9.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as an Assistant Web Designer, a Web Designer,

and Senior Web Designer in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to operating system commands and web document development, design, promotion and scripting.

Program Structure

This program is a planned sequence of instruction consisting of the Business Technology Education Core and three additional occupational completion points. Secondary or postsecondary students who have previously completed the Business Technology Education Core will not have to repeat the core.

When offered at the post secondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	OTA0040	Information Technology Assistant *	150	15-1041
B	CTS0076	Assistant Web Designer	300	15-1099.04
C	CTS0077	Web Designer	300	15-1099.04
D	CTS0078	Senior Web Designer	300	15-1099.04

** Note: OTA0040 is a core program.*

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8200320	Keyboarding and Business Skills	.5 credit	15-1061	2
		AND			
	8200330	Computer and Business Skills	.5 credit		2
		OR			
	8209020	Computing for College and Careers	1 credit		2
		OR			
	8207310	Introduction to Information Technology	1 credit		2
B	8207110 8207120	Web Design 1 Web Design 2	1 credit 1 credit	15-1099.04	2 3
C	8207130	Web Design 3	1 credit	15-1099.04	3

OCP	Course Number	Course Title	Length	SOC Code	Level
	8207140	Web Design 4	1 credit		3
D	8207150 8207160	Web Design 5 Web Design 6	1 credit 1 credit	15-1099.04	3 3

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills for secondary students. For postsecondary students, Phi Beta Lambda and BPA are the appropriate student organizations. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 9.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

The PSAV component of this program (B070500) two statewide articulation agreement approved by the Articulation Coordinating Committee:

1. Graphics Technology AS/AAS (0650040200/1650040200) – 6 credits
2. Internet Services Technology AS/AAS (0507039902/1507039902) – 9 credits

For details on articulation agreements which correlate to programs and industry certifications refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

After successfully completing this program, the student will be able to perform the following:

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning though job shadowing, mentoring, e-coaching, etc.
08.0 Demonstrate personal and interpersonal skills appropriate for the workplace.
09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use Technology to apply and enhance communications skills in technical reading, writing.
04.0 Practice quality performance in the learning environment and the workplace.
05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
09.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
11.0 Perform e-mail activities.
12.0 Demonstrate operating systems.
13.0 Develop an awareness of emerging technologies.

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance and enhance personal performance in relation to the workplace. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal and professional ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.

10.0 Demonstrate personal and interpersonal skills and attributes appropriate for the workplace.
11.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
12.0 Perform e-mail activities.
13.0 Demonstrate operating systems.
14.0 Develop an awareness of emerging technologies.

OR

Introduction to IT Competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.
02.0 Demonstrate Comprehension and communication skills.
03.0 Use technology to enhance the effectiveness of communication skills.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.
10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
11.0 Participate in work-based learning experiences.
12.0 Perform e-mail activities.
13.0 Demonstrate knowledge of different operating systems.
14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW.
15.0 Demonstrate proficiency using HTML commands.
16.0 Demonstrate proficiency in page design applicable to the WWW.
17.0 Demonstrate proficiency using specialized web design software.
18.0 Develop an awareness of the information technology industry.
19.0 Develop an awareness of microprocessors and digital computers.
20.0 Develop an awareness of programming languages.
21.0 Develop an awareness of emerging technologies.
22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model.
23.0 Demonstrate proficiency using common software applications.
24.0 Demonstrate proficiency using specialized software applications.

Program Standards

25.0 Participate in work-based learning experiences.
26.0 Perform e-mail activities.

27.0 Demonstrate proficiency using operating systems.
28.0 Perform decision making activities.
29.0 Demonstrate proficiency navigating the Internet, Intranet, and the WWW.
30.0 Demonstrate proficiency using HTML commands.
31.0 Demonstrate proficiency in page design applicable to the WWW.
32.0 Develop an awareness of Internet/intranet tools.
33.0 Demonstrate proficiency using advanced HTML commands.
34.0 Participate in work-based learning experiences.
35.0 Perform decision making activities.
36.0 Perform layout, design, and measurement activities.
37.0 Demonstrate proficiency using HTML commands.
38.0 Demonstrate Proficiency in graphic editing operations.
39.0 Demonstrate proficiency using interactive web site components.
40.0 Demonstrate proficiency in digital imaging.
41.0 Create digital media web site components.
42.0 Demonstrate proficiency in server configuration standards.
43.0 Participate in work-based learning experiences.
44.0 Perform decision making activities.
45.0 Develop an awareness of Internet/Intranet tools.
46.0 Demonstrate proficiency in web site marketing fundamentals.
47.0 Demonstrate proficiency using interactive Web site components.
48.0 Demonstrate proficiency using a scripting language.
49.0 Demonstrate concepts necessary for e-commerce.
50.0 Demonstrate proficiency in page design applications.
51.0 Demonstrate proficiency in web site promotion and registration.
52.0 Participate in a group based business web project.
53.0 Demonstrate language arts knowledge and skills.
54.0 Demonstrate mathematics knowledge and skills.
55.0 Demonstrate science knowledge and skills.
56.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
57.0 Solve problems using critical thinking skills, creativity and innovation.
58.0 Use information technology tools.
59.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
60.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
61.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
62.0 Describe the importance of professional ethics and legal responsibilities.
63.0 Explain the importance of employability skill and entrepreneurship skills.
64.0 Demonstrate personal money-management concepts, procedures, and strategies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Web Design**
PSAV Number: **B070500**

Course Number: OTA0040
Occupational Completion Point – A
Information Technology Assistant – 150 Hours – SOC Code 15-1041

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Demonstrate basic file management skills.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 03.01 Select and use word processing software and accompanying features to enhance written business communications.
- 03.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.
- 03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

07.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
07.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
07.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
07.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

08.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

08.01 Accept constructive criticism.
08.02 Apply appropriate strategies to manage and resolve conflict in work situations.
08.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

09.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
09.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic file management skills.
01.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

02.01 Take notes, organize, summarize, and paraphrase ideas and details.
02.02 Accurately follow written and oral instructions.
02.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
03.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

04.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
04.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

05.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
05.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
05.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
06.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
06.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

07.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
07.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

07.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

08.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
08.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
08.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
08.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
08.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
08.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
08.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
08.08 Build mentor relationships with local professionals in the industry.

09.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

09.01 Accept constructive criticism.
09.02 Apply appropriate strategies to manage and resolve conflict in work situations.
09.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

10.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

11.0 Perform e-mail activities. – The student will be able to:

11.01 Describe e-mail capabilities and functions.
11.02 Use the Internet to perform e-mail activities.

12.0 Demonstrate operating systems. – The student will be able to:

12.01 Identify operating system file naming conventions.

12.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
12.03 Demonstrate a working knowledge of standard file formats.
12.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

13.0 Develop an awareness of emerging technologies. – The student will be able to:

13.01 Compare and contrast various methods of evaluation for emerging technologies.
13.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
13.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance — The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic computer file management skills.
01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills — The student will be able to:

02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
02.02 Write clear and well-organized research papers, integrating a variety of information.
02.03 Prepare and deliver an oral report with appropriate materials to the class
02.04 Participate in large group discussions as a member and/or a leader.
02.05 Take notes, organize, summarize, and paraphrase ideas and details.
02.06 Accurately follow written and oral instructions.
02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills — The student will be able to:

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles — The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace — The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance — The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance — The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals — The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals — The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace — The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance — The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies — The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Introduction to Information Technology competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance — The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills — The student will be able to:

02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
02.02 Use professional business vocabulary appropriate for information technology environments.
02.03 Organize ideas and communicate oral and written messages appropriate for information technology environments.
02.04 Collaborate with individuals and teams to complete tasks and solve information technology problems.
02.05 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
02.06 Apply the writing process to the creation of appropriate documents following designated business formats.
02.07 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills — The student will be able to:

03.01 Use database, spreadsheet, and presentation software, scheduling, and integrated software packages to enhance communication.
03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles — The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace — The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance — The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance — The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals — The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals — The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace — The student will be able to:

10.01 Accept constructive criticism.
10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences — The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.
12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.
12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems — The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW — The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.

14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, pdf, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using HTML commands — The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the WWW — The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software — The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry — The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.

18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers — The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages — The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies — The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model — The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software

23.0 Demonstrate proficiency using common software applications — The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail,

presentation, database, scheduling, financial management, Java applet, music, etc.).

23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications — The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

Course Number: CTS0076
Occupational Completion Point – B
Assistant Web Designer – 300 Hours – SOC Code 15-1099.04

25.0 Participate in work-based learning experiences — The student will be able to:

25.01 Participate in work-based learning experiences in a Web Design environment.
25.02 Discuss the use of technology in a Web Design Services (Web Design) environment.
25.03 Compare and contrast the software applications used in a Web Design Services (Web Design) environment.

26.0 Perform e-mail activities — The student will be able to:

26.01 Describe e-mail capabilities and functions.
26.02 Create and send e-mail messages with attachments.
26.03 Reply to and forward e-mail messages.
26.04 Organize and manage e-mail messages.
26.05 Utilize all applicable e-mail options and functions.
26.06 Use the Internet to perform e-mail activities.
26.07 Define the standards used by Internet/Intranet e-mail (e.g., pop3, mime).
26.08 Describe the issues involved in sending and receiving documents as e-mail attachments.
26.09 Identify privacy issues in the employee/employer relationship (e.g., avoid libel, spam, personal usage).

27.0 Demonstrate proficiency using operating systems — The student will be able to:

27.01 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
27.02 Describe the difference between relative and absolute path commands.
27.03 Demonstrate a working knowledge of standard file formats.

27.04 Demonstrate proficiency with help references.

28.0 Perform decision making activities - The student will be able to:
28.01 Determine work priorities.
28.02 Evaluate and select appropriate software packages to complete assigned tasks.
28.03 Evaluate information to be used and choose relevant material.
28.04 Determine the audience.
28.05 Compare and select appropriate multimedia tools.

29.0 Demonstrate proficiency navigating the internet, intranet, and the WWW — The student will be able to:

29.01 Identify and describe Web terminology.
29.02 Describe the history of the Internet and Intranet.
29.03 Describe the difference between a client and a server.
29.04 Describe the difference between the Internet, Intranet, and WWW.
29.05 Describe the different methods by which information may be accessed on the Internet/Intranet (e.g., browser, FTP, gopher, telnet, veronica).
29.06 List the available resources and services on the Internet (e.g., electronic commerce, personal, government, business, etiquette, education, distance learning).
29.07 Locate information on the Internet/Intranet using a Web browser.
29.08 Copy information from the Internet/Intranet, save, and print using a Web browser.
29.09 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
29.10 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
29.11 Identify and use search engines to locate information.
29.12 Describe the various ways of communicating on the Internet/Intranet (e.g., e-mail, forums, IRC, CHAT, Listserv, Usenet, MOOs, etc.).
29.13 Describe and observe Internet/Intranet ethics and copyright laws.
29.14 Identify methods to protect personal copyright.

30.0 Demonstrate proficiency using HTML commands — The student will be able to:

30.01 Identify elements of a Web page.
30.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
30.03 Define basic HTML terminology.
30.04 Analyze HTML source code developed by others.
30.05 Create a Web page using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
30.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
30.07 Add graphics to Web pages.
30.08 Edit and test HTML documents for accuracy and validity.
30.09 Use basic functions of HTML editors and converters.
30.10 Use basic functions of WYSIWYG editors.

31.0 Demonstrate proficiency in page design applicable to the WWW — The student will be able to:

31.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
31.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
31.03 Identify and convert graphic formats.
31.04 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD ROMS).
31.05 Use image design software to create and edit images.
31.06 Embed video files into Web page designs.
31.07 Embed audio files into Web page designs.
31.08 Embed animation files into Web page designs.
31.09 Use a team approach for Web project design.
31.10 Identify design strategies to reach and keep your audience.
31.11 Determine the objectives and the audience of Web sites.
31.12 Create storyboards of Web sites.
31.13 Create maps of index pages.
31.14 Use style sheets for consistent Web site design.
31.15 Create images for Web sites using digital imaging software.
31.16 Edit images using appropriate software.
31.17 Identify and create low-bandwidth graphic file types (e.g., transparent images, filters).
31.18 Create buttons for Web sites.
31.19 Format text for Web sites (e.g., font families, sizes).
31.20 Format online images for Web sites.
31.21 Create links to external images.
31.22 Optimize page size for effective downloading to browsers.
31.23 Build Web sites for publication using conventional file name structures.
31.24 Edit and test Web sites for accuracy and validity.
31.25 Compare and contrast appropriate design elements of various industries.

32.0 Develop an awareness of Internet/intranet tools - The student will be able to:

32.01 Describe the various hardware components used on the Internet/Intranet.
32.02 Demonstrate the use of compression programs.
32.03 Demonstrate the use of backups.
32.04 Demonstrate the use of various software components used on the Internet (e.g., browser software with plug-ins).
32.05 Configure a browser for use with a plug-in.
32.06 Summarize the features of various plug-ins.

33.0 Demonstrate proficiency using advanced HTML commands — The student will be able to:

33.01 Use advanced storyboarding and organization for Web site design.
33.02 Develop, integrate, and apply the use of frames in Web site design (e.g., simple and complex framesets).
33.03 Develop, integrate, and apply the use of client-side image maps in Web site design.
33.04 Develop, integrate, and apply the use of forms in Web site design.
33.05 Develop, integrate, and apply HTML codes for search engines (e.g., META tags).

33.06 Use advanced functions of HTML editors and converters.
33.07 Explore and integrate new HTML tags as they are developed.
33.08 Compare and contrast WYSIWYG editors.
33.09 Compare and contrast HTML editors.

53.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

53.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
53.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
53.03 Present information formally and informally for specific purposes and audiences. AF2.9

54.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

54.01 Demonstrate knowledge of arithmetic operations. AF3.2
54.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
54.03 Construct charts/tables/graphs using functions and data. AF3.5

55.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

55.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
55.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

56.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

56.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
56.02 Locate, organize and reference written information from various sources. CM 3.0
56.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
56.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
56.05 Apply active listening skills to obtain and clarify information. CM 7.0
56.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
56.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

57.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

57.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
57.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
57.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
57.04 Conduct technical research to gather information necessary for decision-making. PS 4.0

58.0 Use information technology tools. – The student will be able to:

58.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
58.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
58.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
58.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

59.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

59.01 Describe the nature and types of business organizations. SY 1.0
59.02 Explain the effect of key organizational systems on performance and quality.
59.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
59.04 Explain the impact of the global economy on business organizations.

62.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

62.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
62.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
62.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
62.04 Interpret and explain written organizational policies and procedures. ELR 2.0

Course Number: CTS0077
Occupational Completion Point – C
Web Designer – 300 Hours – SOC Code 15-1099.04

34.0 Participate in work-based learning experiences — The student will be able to:

34.01 Participate in work-based learning experiences in a Web Design environment.
34.02 Discuss the use of technology in a Web Design environment.
34.03 Compare and contrast the software applications used in a Web Design Services (Web Design) environment.

35.0 Perform decision making activities — The student will be able to:

35.01 Present and defend design projects.
35.02 Determine project specifications.

36.0 Perform layout, design and measurement activities — The student will be able to:

36.01 Prepare rough layout designs.
36.02 Identify elements of design.
36.03 Utilize and formulate advanced storyboarding techniques.

36.04 Utilize navigational efficiency in the creation of Web sites.

37.0 Demonstrate proficiency using advanced HTML commands — The student will be able to:

37.01 Use advanced functions of HTML editors and converters.
37.02 Explore and integrate new HTML tags as they are developed.
37.03 Use advanced functions of WYSIWYG editors.

38.0 Demonstrate proficiency using interactive web site components — The student will be able to:

38.01 Discuss the components of multimedia applicable to the WWW.
38.02 Discuss the technical requirements necessary to view multimedia Web sites.
38.03 Identify and incorporate interactive elements on Web pages.
38.04 Identify animation technologies.
38.05 Demonstrate the components of online conferencing.
38.06 Demonstrate the components of enhanced HTML (e.g., Dynamic HTML).
38.07 Create embed, and demonstrate multimedia components using various tools (e.g., QuickTime, Shockwave, ScreenCam, ActiveX, PDF).
38.08 Edit and test enhancements for accuracy and validity.

39.0 Demonstrate proficiency in graphic editing operations — The student will be able to:

39.01 Produce designs integrating all elements of design.
39.02 Complete projects using a variety of fonts, sizes, leading, and alignments.
39.03 Produce electronic illustrations using graphic editing software.
39.04 Produce documents integrating all elements of design using balance and continuity.
39.05 Produce projects using illustrations.
39.06 Produce projects using white space.
39.07 Design logos using type.

40.0 Demonstrate proficiency in digital imaging — The student will be able to:

40.01 Demonstrate advance usage of a scanner/slide scanner.
40.02 Crop and scale photographs and line art electronically.
40.03 Demonstrate an understanding of formats and modes.
40.04 Demonstrate use of image editing software.
40.05 Demonstrate advanced usage of digital imaging (e.g., digital camera, photo disk).

41.0 Create digital media web site components — The student will be able to:

41.01 Create and edit video files for Web sites.
41.02 Create and edit audio files for Web sites.
41.03 Create animations using current tools.
41.04 Edit and test enhancements for accuracy and validity.

42.0 Demonstrate proficiency in server configuration standards.

60.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

60.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
60.02 Explain emergency procedures to follow in response to workplace accidents.
60.03 Create a disaster and/or emergency response plan. SHE 2.0

61.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

61.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
61.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
61.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
61.04 Employ mentoring skills to inspire and teach others. LT 5.0

63.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

63.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
63.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
63.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
63.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
63.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
63.06 Identify and exhibit traits for retaining employment. ECD 7.0
63.07 Identify opportunities and research requirements for career advancement. ECD 8.0
63.08 Research the benefits of ongoing professional development. ECD 9.0
63.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

64.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

64.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
64.02 Describe the effect of money management on personal and career goals. FL 3.0
64.03 Develop a personal budget and financial goals. FL3.1
64.04 Complete financial instruments for making deposits and withdrawals. FL3.2
64.05 Maintain financial records. FL3.3
64.06 Read and reconcile financial statements. FL3.4
64.07 Research, compare and contrast investment opportunities.

Course Number: CTS0078
Occupational Completion Point – D
Senior Web Designer – 300 Hours – SOC Code 15-1099.04

43.0 Participate in work-based learning experiences — The student will be able to:

43.01 Participate in work-based learning experiences in a Web Design Services (Web Design) environment.
43.02 Discuss the use of technology in a Web Design Services (Web Design) environment.
43.03 Compare and contrast the software applications used in a Web Design Services (Web Design) environment.

44.0 Perform decision making activities — The student will be able to:

44.01 Determine advanced project specifications.
44.02 Present and defend advanced design projects.

45.0 Develop an awareness of Internet/intranet tools — The student will be able to:

45.01 Demonstrate file transfer protocol.
45.02 Identify and use techniques/software for multiple page downloading.

46.0 Demonstrate proficiency in web site marketing fundamentals — The student will be able to:

46.01 Create a marketing strategy for the Web site.
46.02 Create a business plan for the Web site including research on competitive URL's.
46.03 Describe costing and proposal writing.
46.04 Identify, compare and select Internet services required for publishing site.

47.0 Demonstrate proficiency using interactive web site components — The student will be able to:

47.01 Create animations using current tools.
47.02 Demonstrate professional communication skills with clients (e.g., in the conception, creation and implementation of the web site).

48.0 Demonstrate proficiency using a scripting language – The student will be able to:

48.01 List common scripting languages.
48.02 Compare features of different scripting languages.
48.03 Analyze scripts developed by others.
48.04 Modify existing scripts.
48.05 Create and embed scripts for Web page enhancement.
48.06 Create scripts to transfer data from a form to a database.
48.07 Edit and test scripts for accuracy and validity.
48.08 Create searchable indexes.

49.0 Demonstrate concepts necessary for e-commerce — The student will be able to:

49.01 Define e-commerce.
49.02 Discuss security issues.
49.03 Compare existing e-commerce sites.
49.04 Discuss components of a successful web presence.
49.05 Contact e-commerce providers to determine current standards (e.g., Visa, MC, AmEx, banks).

50.0 Demonstrate proficiency in page design applications — The student will be able to:

50.01 Create embedded video files for Web page designs.
50.02 Create embedded audio files for Web page designs.
50.03 Create embedded animation files for Web page designs (e.g., Flash).

51.0 Demonstrate proficiency in web site promotion and registration – The student will be able to:

51.01 Describe ways in which organizations can use Internet/Intranet technology to reduce costs, improve communications, and market products or images.
51.02 Demonstrate the use of offline promotion.
51.03 List different models for creating an organizational presence on the Web.
51.04 Describe site registration procedures.
51.05 Create an evaluation plan to measure the effectiveness of the Web site (e.g., page counters, logs, search engines, asking visitors how they found your site).
51.06 Develop an awareness of online resources for doing business on the Internet/Intranet.
51.07 Demonstrate site registration with major search engines and Web directories

52.0 Participate in group based business web project — The student will be able to:

52.01 Formulate a design team for a web site project.
52.02 Determine individual and group responsibilities.
52.03 Create a web site for a business as an individual.
52.04 Create a web site as a team for a business.
52.05 Determine design issues.
52.06 Coordinate story boards into the overall design.
52.07 Assign management responsibilities necessary for project completion.
52.08 Determine schedules and deadlines.
52.09 Review, edit and implement the project.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Keyboarding and Business Skills**
Course Number: **8200320**
Course Credit: **.5**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental word processing applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society.

This course, along with Computer and Business Skills is equivalent to Computing for College and Careers. Students should complete this course before enrolling in Computer and Business Skills.

10.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 10.01 Develop keyboarding skills to enter and manipulate text and data.
- 10.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 10.03 Demonstrate basic file management skills.

11.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 11.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 11.02 Write clear and well-organized research papers, integrating a variety of information.
- 11.03 Prepare and deliver an oral report with appropriate materials to the class
- 11.04 Participate in large group discussions as a member and/or a leader.
- 11.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 11.06 Accurately follow written and oral instructions.
- 11.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

12.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 12.01 Select and use word processing software and accompanying features to enhance written business communications.
- 12.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.

12.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

13.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

13.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
13.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
13.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

14.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

14.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
14.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

15.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

15.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
15.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
15.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

16.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

16.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
16.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.

16.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
16.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

17.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

17.01 Accept constructive criticism.
17.02 Apply appropriate strategies to manage and resolve conflict in work situations.
17.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

18.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
18.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer and Business Skills**
Course Number: **8200330**
Course Credit: **.5**

Course Description:

This course is designed to introduce students to the basic skills and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

This course, along with Keyboarding and Business Skills is equivalent to Computing for College and Careers. Students should complete Keyboarding and Business Skills before enrolling in this course.

14.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 14.01 Develop keyboarding skills to enter and manipulate text and data.
- 14.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 14.03 Identify and describe communications and networking systems used in workplace environments.
- 14.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 14.05 Demonstrate basic file management skills.
- 14.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
- 14.07 Describe ethical issues and problems associated with computers and information systems.
- 14.08 Apply ergonomic principles applicable to the configuration of computer workstations.

15.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

- 15.01 Take notes, organize, summarize, and paraphrase ideas and details.
- 15.02 Accurately follow written and oral instructions.
- 15.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

16.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

16.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
16.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
16.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

17.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

17.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
17.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

18.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
18.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
18.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

19.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

19.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
19.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
19.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

20.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

20.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
20.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

20.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

21.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

21.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
21.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
21.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
21.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
21.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
21.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
21.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
21.08 Build mentor relationships with local professionals in the industry.

22.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

22.01 Accept constructive criticism.
22.02 Apply appropriate strategies to manage and resolve conflict in work situations.
22.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

23.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

23.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

24.0 Perform e-mail activities. – The student will be able to:

24.01 Describe e-mail capabilities and functions.
24.02 Use the Internet to perform e-mail activities.

25.0 Demonstrate operating systems. – The student will be able to:

25.01 Identify operating system file naming conventions.

25.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
25.03 Demonstrate a working knowledge of standard file formats.
25.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

26.0 Develop an awareness of emerging technologies. – The student will be able to:

26.01 Compare and contrast various methods of evaluation for emerging technologies.
26.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
26.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computing for College and Careers**
Course Number: **8209020**
Course Credit: **1**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society. This also includes proficiency with computers using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance-The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Demonstrate basic computer file management skills.
- 01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.07 Describe ethical issues and problems associated with computers and information systems.
- 01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills-The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills-The student will be able to:

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles-The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace-The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance-The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance-The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals-The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals-The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up).
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace-The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance-The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities–The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems–The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies-The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Introduction to Information Technology**
Course Number: **8207310**
Course Credit: **1**

Course Description:

This course is designed to provide an introduction to information technology concepts and careers as well as the impact information technology has on the world, people, and industry and basic web design concepts. The content includes information technology career research; operating systems and software applications; electronic communications including e-mail and Internet services; basic HTML, DHTML, and XML web commands and design; and emerging technologies and web page design.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance — The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills — The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles — The student will be able to:

This standard supports the following Sunshine State Standards: [SSS #1, SSS#2, SSS #3, SSS #4, SSS #5, etc.]

04.01 Explore, design, implement, and evaluate organizational structures and cultures.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace — The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance — The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance — The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).

07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals — The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals — The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace — The student will be able to:

10.01 Accept constructive criticism.
10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences — The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.

12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.
12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the www – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, pdf, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using html commands – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.

15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the www – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software - The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry - The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers - The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages - The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.

20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies - The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the open systems interface (osi) model - The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications - The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications - The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Web Design 1**
Course Number: **8207110**
Course Credit: **1**

Course Description:

This course is designed to provide a basic overview of the Internet, Intranet, and WWW. The content includes operating systems; basic HTML commands; navigation of the Internet, Intranet, and Web; and Web page design.

25.0 Participate in work-based learning experiences — The student will be able to:

- 25.01 Participate in work-based learning experiences in a Web Design environment.
- 25.02 Discuss the use of technology in a Web Design Services (Web Design) environment.
- 25.03 Compare and contrast the software applications used in a Web Design Services (Web Design) environment.

26.0 Perform e-mail activities — The student will be able to:

- 26.01 Describe e-mail capabilities and functions.
- 26.02 Create and send e-mail messages with attachments.
- 26.03 Reply to and forward e-mail messages.
- 26.04 Organize and manage e-mail messages.
- 26.05 Utilize all applicable e-mail options and functions.
- 26.06 Use the Internet to perform e-mail activities.
- 26.07 Define the standards used by Internet/Intranet e-mail (e.g., pop3, mime).
- 26.08 Describe the issues involved in sending and receiving documents as e-mail attachments.
- 26.09 Identify privacy issues in the employee/employer relationship (e.g., avoid libel, spam, personal usage).

27.0 Demonstrate proficiency using operating systems — The student will be able to:

- 27.01 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
- 27.02 Describe the difference between relative and absolute path commands.
- 27.03 Demonstrate a working knowledge of standard file formats.
- 27.04 Demonstrate proficiency with help references.

28.0 Perform decision making activities - The student will be able to:

- 28.01 Determine work priorities.
- 28.02 Evaluate and select appropriate software packages to complete assigned tasks.
- 28.03 Evaluate information to be used and choose relevant material.
- 28.04 Determine the audience.
- 28.05 Compare and select appropriate multimedia tools.

29.0 Demonstrate proficiency navigating the Internet, intranet, and the WWW — The student will be able to:

29.01 Identify and describe Web terminology.
29.02 Describe the history of the Internet and intranet.
29.03 Describe the difference between a client and a server.
29.04 Describe the difference between the Internet, intranet, and WWW.
29.05 Describe the different methods by which information may be accessed on the Internet/intranet (e.g., browser, FTP, gopher, telnet, veronica).
29.06 List the available resources and services on the Internet (e.g., electronic commerce, personal, government, business, etiquette, education, distance learning).
29.07 Locate information on the Internet/intranet using a Web browser.
29.08 Copy information from the Internet/intranet, save, and print using a Web browser.
29.09 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
29.10 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
29.11 Identify and use search engines to locate information.
29.12 Describe the various ways of communicating on the Internet/Intranet (e.g., e-mail, forums, IRC, CHAT, Listserv, Usenet, MOOs, etc.).
29.13 Describe and observe Internet/intranet ethics and copyright laws.
29.14 Identify methods to protect personal copyright.

30.0 Demonstrate proficiency using HTML commands — The student will be able to:

30.01 Identify elements of a Web page.
30.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
30.03 Define basic HTML terminology.
30.04 Analyze HTML source code developed by others.
30.05 Create a Web page using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
30.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
30.07 Add graphics to Web pages.
30.08 Edit and test HTML documents for accuracy and validity.
30.09 Use basic functions of HTML editors and converters.
30.10 Use basic functions of WYSIWYG editors.

31.0 Demonstrate proficiency in page design applicable to the WWW — The student will be able to:

31.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
31.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
31.03 Identify and convert graphic formats.
31.04 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD ROMS).

31.05 Use image design software to create and edit images.

32.0 Develop an awareness of Internet/intranet tools - The student will be able to:

32.01 Describe the various hardware components used on the Internet/Intranet.
32.02 Demonstrate the use of compression programs.
32.03 Demonstrate the use of backups.

53.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

53.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
53.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
53.03 Present information formally and informally for specific purposes and audiences. AF2.9

54.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

54.01 Demonstrate knowledge of arithmetic operations. AF3.2
54.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
54.03 Construct charts/tables/graphs using functions and data. AF3.5

55.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

55.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
55.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Web Design 2**
Course Number: **8207120**
Course Credit: **1**

Course Description:

This course provides advanced concepts for Internet, Intranet, and Web design. The content includes Internet/Intranet tools, Web site promotion, advanced HTML commands, advanced page design, and multimedia applications.

25.0 Participate in work-based learning experiences — The student will be able to:

- 25.01 Participate in work-based learning experiences in a Web Design environment.
- 25.02 Discuss the use of technology in a Web Design Services (Web Design) environment.
- 25.03 Compare and contrast the software applications used in a Web Design Services (Web Design) environment.

30.0 Demonstrate proficiency using HTML commands — The student will be able to:

- 30.01 Use advanced storyboarding and organization for Web site design.
- 30.02 Develop, integrate, and apply the use of frames in Web site design (e.g., simple and complex framesets).
- 30.03 Develop, integrate, and apply the use of client-side image maps in Web site design.
- 30.04 Develop, integrate, and apply the use of forms in Web site design.
- 30.05 Develop, integrate, and apply HTML codes for search engines (e.g., META tags).
- 30.06 Use advanced functions of HTML editors and converters.
- 30.07 Explore and integrate new HTML tags as they are developed.
- 30.08 Compare and contrast WYSIWYG editors.
- 30.09 Compare and contrast HTML editors.

31.0 Demonstrate proficiency in page design applicable to the www — The student will be able to:

- 31.01 Embed video files into Web page designs.
- 31.02 Embed audio files into Web page designs.
- 31.03 Embed animation files into Web page designs.
- 31.04 Use a team approach for Web project design.
- 31.05 Identify design strategies to reach and keep your audience.
- 31.06 Determine the objectives and the audience of Web sites.
- 31.07 Create storyboards of Web sites.
- 31.08 Create maps of index pages.
- 31.09 Use style sheets for consistent Web site design.
- 31.10 Create images for Web sites using digital imaging software.
- 31.11 Edit images using appropriate software.

31.12 Identify and create low-bandwidth graphic file types (e.g., transparent images, filters).
31.13 Create buttons for Web sites.
31.14 Format text for Web sites (e.g., font families, sizes).
31.15 Format online images for Web sites.
31.16 Create links to external images.
31.17 Optimize page size for effective downloading to browsers.
31.18 Build Web sites for publication using conventional file name structures.
31.19 Edit and test Web sites for accuracy and validity.
31.20 Compare and contrast appropriate design elements of various industries.

32.0 Develop an awareness of internet/intranet tools - The student will be able to:

32.01 Demonstrate the use of various software components used on the Internet (e.g., browser software with plug-ins).
32.02 Configure a browser for use with a plug-in.
32.03 Summarize the features of various plug-ins.

33.0 Demonstrate proficiency using advanced HTML commands — The student will be able to:

33.01 Use advanced storyboarding and organization for Web site design.
33.02 Develop, integrate, and apply the use of frames in Web site design (e.g., simple and complex framesets).
33.03 Develop, integrate, and apply the use of client-side image maps in Web site design.
33.04 Develop, integrate, and apply the use of forms in Web site design.
33.05 Develop, integrate, and apply HTML codes for search engines (e.g., META tags).
33.06 Use advanced functions of HTML editors and converters.
33.07 Explore and integrate new HTML tags as they are developed.
33.08 Compare and contrast WYSIWYG editors.
33.09 Compare and contrast HTML editors.

56.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

56.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
56.02 Locate, organize and reference written information from various sources. CM 3.0
56.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
56.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
56.05 Apply active listening skills to obtain and clarify information. CM 7.0
56.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
56.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

57.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

57.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
57.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
57.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
57.04 Conduct technical research to gather information necessary for decision-making. PS 4.0

58.0 Use information technology tools. – The student will be able to:

58.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
58.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
58.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
58.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

59.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

59.01 Describe the nature and types of business organizations. SY 1.0
59.02 Explain the effect of key organizational systems on performance and quality.
59.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
59.04 Explain the impact of the global economy on business organizations.

62.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

62.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
62.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
62.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
62.04 Interpret and explain written organizational policies and procedures. ELR 2.0

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Web Design 3**
Course Number: **8207130**
Course Credit: **1**

Course Description:

This course provides advanced concepts in HTML, design, and Internet tools.

34.0 Participate in work-based learning experiences — The student will be able to:

- 34.01 Participate in work-based learning experiences in a Web Design environment.
- 34.02 Discuss the use of technology in a Web Design environment.
- 34.03 Compare and contrast the software applications used in a Web Design Services (Web Design) environment.

35.0 Perform decision making activities **-** The student will be able to:

- 35.01 Present and defend design projects.
- 35.02 Determine project specifications.

36.0 Perform layout, design and measurement activities - The student will be able to:

- 36.01 Prepare rough layout designs.
- 36.02 Identify elements of design.
- 36.03 Utilize and formulate advanced storyboarding techniques.
- 36.04 Utilize navigational efficiency in the creation of Web sites.

37.0 Demonstrate proficiency using advanced HTML commands — The student will be able to:

- 37.01 Use advanced functions of HTML editors and converters.
- 37.02 Explore and integrate new HTML tags as they are developed.
- 37.03 Use advanced functions of WYSIWYG editors.

38.0 Demonstrate proficiency using interactive web site components — The student will be able to:

- 38.01 Discuss the components of multimedia applicable to the WWW.
- 38.02 Discuss the technical requirements necessary to view multimedia Web sites.
- 38.03 Identify and incorporate interactive elements on Web pages.
- 38.04 Identify animation technologies.
- 38.05 Demonstrate the components of online conferencing.
- 38.06 Demonstrate the components of enhanced HTML (e.g., Dynamic HTML).
- 38.07 Create embed, and demonstrate multimedia components using various tools (e.g., QuickTime, Shockwave, ScreenCam, ActiveX, PDF).
- 38.08 Edit and test enhancements for accuracy and validity.

60.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

60.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
60.02 Explain emergency procedures to follow in response to workplace accidents.
60.03 Create a disaster and/or emergency response plan. SHE 2.0

61.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

61.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
61.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
61.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
61.04 Employ mentoring skills to inspire and teach others. LT 5.0

63.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

63.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
63.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
63.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
63.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
63.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
63.06 Identify and exhibit traits for retaining employment. ECD 7.0
63.07 Identify opportunities and research requirements for career advancement. ECD 8.0
63.08 Research the benefits of ongoing professional development. ECD 9.0
63.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

64.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

64.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
64.02 Describe the effect of money management on personal and career goals. FL 3.0
64.03 Develop a personal budget and financial goals. FL3.1
64.04 Complete financial instruments for making deposits and withdrawals. FL3.2
64.05 Maintain financial records. FL3.3
64.06 Read and reconcile financial statements. FL3.4
64.07 Research, compare and contrast investment opportunities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Web Design 4**
Course Number: **8207140**
Course Credit: **1**

Course Description:

This course provides advanced concepts in web site promotion, interactive web site development, and using scripting languages as they relate to WWW site.

34.0 Participate in work-based learning experiences — The student will be able to:

- 34.01 Participate in work-based learning experiences in a Web Design Services (Web Design) environment.
- 34.02 Discuss the use of technology in a Web Design Services (Web Design) environment.
- 34.03 Compare and contrast the software applications used in a Web Design Services (Web Design) environment.

39.0 Demonstrate proficiency in graphic editing operations - The student will be able to:

- 39.01 Produce designs integrating all elements of design.
- 39.02 Complete projects using a variety of fonts, sizes, leading, and alignments.
- 39.03 Produce electronic illustrations using graphic editing software.
- 39.04 Produce documents integrating all elements of design using balance and continuity.
- 39.05 Produce projects using illustrations.
- 39.06 Produce projects using white space.
- 39.07 Design logos using type.

40.0 Demonstrate proficiency in digital imaging - The student will be able to:

- 40.01 Demonstrate advance usage of a scanner/slide scanner.
- 40.02 Crop and scale photographs and line art electronically.
- 40.03 Demonstrate an understanding of formats and modes.
- 40.04 Demonstrate use of image editing software.
- 40.05 Demonstrate advanced usage of digital imaging (e.g., digital camera, photo disk).

41.0 Demonstrate proficiency using interactive web site components — The student will be able to:

- 41.01 Create and edit video files for Web sites.
- 41.02 Create and edit audio files for Web sites.
- 41.03 Create animations using current tools.
- 41.04 Edit and test enhancements for accuracy and validity.

42.0 Demonstrate proficiency in server configuration standards.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Web Design 5**
Course Number: **8207150**
Course Credit: **1**

Course Description:

This course is designed to present an overview of e-commerce, introduce scripting and increase proficiency in audiovisual techniques.

43.0 Participate in work-based learning experiences — The student will be able to:

- 43.01 Participate in work-based learning experiences in a Web Design Services (Web Design) environment.
- 43.02 Discuss the use of technology in a Web Design Services (Web Design) environment.
- 43.03 Compare and contrast the software applications used in a Web Design Services (Web Design) environment.

44.0 Perform decision making activities — The student will be able to:

- 44.01 Determine advanced project specifications.
- 44.02 Present and defend advanced design projects.

45.0 Develop and awareness of Internet/intranet tools — The student will be able to:

- 45.01 Demonstrate file transfer protocol.
- 45.02 Identify and use techniques/software for multiple page downloading.

46.0 Demonstrate proficiency in web site marketing fundamentals — The student will be able to:

- 46.01 Create a marketing strategy for the Web site.
- 46.02 Create a business plan for the Web site including research on competitive URL's.
- 46.03 Describe costing and proposal writing.
- 46.04 Identify, compare and select Internet services requited for publishing site.

47.0 Demonstrate proficiency using interactive web site components — The student will be able to:

- 47.01 Create animations using current tools.
- 47.02 Demonstrate professional communication skills with clients (e.g., in the conception, creation and implementation of the web site).

48.0 Demonstrate proficiency using a scripting language – The student will be able to:

- 48.01 List common scripting languages.
- 48.02 Compare features of different scripting languages.

48.03 Analyze scripts developed by others.
48.04 Modify existing scripts.
48.05 Create and embed scripts for Web page enhancement.
48.06 Create scripts to transfer data from a form to a database.
48.07 Edit and test scripts for accuracy and validity.
48.08 Create searchable indexes.

49.0 Demonstrate concepts necessary for e-commerce — The student will be able to:

49.01 Define e-commerce.
49.02 Discuss security issues.
49.03 Compare existing e-commerce sites.
49.04 Discuss components of a successful web presence.
49.05 Contact e-commerce providers to determine current standards (e.g., Visa, MC, AmEx, banks).

50.0 Demonstrate proficiency in page design applications — The student will be able to:

50.01 Create embedded video files for Web page designs.
50.02 Create embedded audio files for Web page designs.
50.03 Create embedded animation files for Web page designs (e.g., Flash).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Web Design 6**
Course Number: **8207160**
Course Credit: **1**

Course Description:

With the completion of this course the student will be able to plan, design, implement and promote a business web site using both individual and team talents. Students will demonstrate proficiency with industry standard software.

43.0 Participate in work-based learning experiences — The student will be able to:

- 43.01 Participate in work-based learning experiences in a Web Design Services (Web Design) environment.
- 43.02 Discuss the use of technology in a Web Design Services (Web Design) environment.
- 43.03 Compare and contrast the software applications used in a Web Design Services (Web Design) environment.

51.0 Demonstrate proficiency in web site promotion and registration – The student will be able to:

- 51.01 Describe ways in which organizations can use Internet/Intranet technology to reduce costs, improve communications, and market products or images.
- 51.02 Demonstrate the use of offline promotion.
- 51.03 List different models for creating an organizational presence on the Web.
- 51.04 Describe site registration procedures.
- 51.05 Create an evaluation plan to measure the effectiveness of the Web site (e.g., page counters, logs, search engines, asking visitors how they found your site).
- 51.06 Develop an awareness of online resources for doing business on the Internet/Intranet.
- 51.07 Demonstrate site registration with major search engines and Web directories

52.0 Participate in group based business web project — The student will be able to:

- 52.01 Formulate a design team for a web site project.
- 52.02 Determine individual and group responsibilities.
- 52.03 Create a web site for a business as an individual.
- 52.04 Create a web site as a team for a business.
- 52.05 Determine design issues.
- 52.06 Coordinate story boards into the overall design.
- 52.07 Assign management responsibilities necessary for project completion.
- 52.08 Determine schedules and deadlines.
- 52.09 Review, edit and implement the project.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Network Support Services**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	8208000	B078000
CIP Number	0507.030402	0507.030402
Grade Level	9-12, 30, 31	30, 31
Standard Length	7 credits	1050 hours
Teacher Certification	BUS ED 1 @2 VOE @7 TEACH CBE @7 BUS DP @7 G ELECT DP @7 G BOOKKEEPIN @4 7 G CLERICAL @7 G SECRETAR @7 G TEC ELEC $7 G COMPU SCI 6 COMP SVC @ 7 G	BUS ED 1 @2 VOE @7 TEACH CBE @7 BUS DP @7 G ELECT DP @7 G BOOKKEEPIN @4 7 G CLERICAL @7 G SECRETAR @7 G TEC ELEC $7 G COMPU SCI 6 COMP SVC @ 7 G
CTSO	FBLA BPA	Phi Beta Lambda BPA
SOC Codes (all applicable)	15-1041; 15-1071; 15-1081	15-1041; 15-1071; 15-1081
Facility Code	[212] http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	Mathematics: 9.0 Language: 9.0 Reading: 9.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in network support services positions in the

Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster. This program offers a broad foundation of knowledge and skills to prepare students for employment.

The content includes but is not limited to instruction in computer literacy; software application support; basic hardware configuration and troubleshooting; networking technologies, troubleshooting, security, and administration; and customer service and human relations skills.

Program Structure

This program is a planned sequence of instruction consisting of the Business Technology Education Core and six additional occupational completion points. Secondary or postsecondary students who have previously completed the Business Technology Education Core will not have to repeat the core. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or exit as an occupational completer.

When offered at the post secondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	OTA0040	Information Technology Assistant	150	15-1041
B	EEV0504	Computer Support Assistant	150	15-1041
C	CTS0022	Network Support Help Desk Assistant	150	15-1071
D	CTS0023	Network Support Administrator	150	15-1071
E	CTS0024	Senior Network Administrator	150	15-1081
F	CTS0029	Wireless Network Administrator	150	15-1081
G	EEV0317	Data Communications Analyst	150	15-1081

** Note: OTA0040 is a core program.*

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8200320	Keyboarding and Business Skills	.5 credit	15-1061	2
		AND			
	8200330	Computer and Business Skills	.5 credit		2
		OR			
	8209020	Computing for College and Careers	1 credit		2

OCP	Course Number	Course Title	Length	SOC Code	Level
		OR			
	8207310	Introduction to Information Technology	1 credit		2
B	8207020	Networking 1	1 credit	15-1041	2
C	8207030	Networking 2, Infrastructure	1 credit	15-1071	3
D	8207040	Networking 3, Infrastructure	1 credit	15-1071	3
E	8207050	Networking 4, Infrastructure	1 credit	15-1081	3
F	8207060	Networking 5	1 credit	15-1081	3
G	8207070	Networking 6	1 credit	15-1081	3

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills for secondary students. For postsecondary students, Phi Beta Lambda and BPA are the appropriate student organizations. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 9.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List

document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of

the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

The PSAV component of this program (B078000) has two statewide articulation agreements approved by the Articulation Coordinating Committee:

1. Networking Services Technology AAS/AS (0507030401/1507030401) – 9 credits (12 credits if implemented as a Cisco Networking Academy)

2. Computer Engineering Technology AAS/AS (0615040200/1615040200) – 9 credits (12 credits if implemented as a Cisco Networking Academy)

For details on articulation agreements which correlate to programs and industry certifications refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

After successfully completing this program, the student will be able to perform the following:

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.

07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning though job shadowing, mentoring, e-coaching, etc.
08.0 Demonstrate personal and interpersonal skills appropriate for the workplace.
09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use Technology to apply and enhance communications skills in technical reading, writing.
04.0 Practice quality performance in the learning environment and the workplace.
05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
09.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
11.0 Perform e-mail activities.
12.0 Demonstrate operating systems.
13.0 Develop an awareness of emerging technologies.

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance and enhance personal performance in relation to the workplace. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal and professional ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
10.0 Demonstrate personal and interpersonal skills and attributes appropriate for the workplace.
11.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
12.0 Perform e-mail activities.
13.0 Demonstrate operating systems.
14.0 Develop an awareness of emerging technologies.

OR

Introduction to IT Competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.
02.0 Demonstrate Comprehension and communication skills.
03.0 Use technology to enhance the effectiveness of communication skills.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.
10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
11.0 Participate in work-based learning experiences.
12.0 Perform e-mail activities.
13.0 Demonstrate knowledge of different operating systems.
14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW.
15.0 Demonstrate proficiency using HTML commands.
16.0 Demonstrate proficiency in page design applicable to the WWW.
17.0 Demonstrate proficiency using specialized web design software.
18.0 Develop an awareness of the information technology industry.

19.0 Develop an awareness of microprocessors and digital computers.
20.0 Develop an awareness of programming languages.
21.0 Develop an awareness of emerging technologies.
22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model.
23.0 Demonstrate proficiency using common software applications.
24.0 Demonstrate proficiency using specialized software applications.

Program Standards

25.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
26.0 Identify, install, configure, and upgrade desktop and server computer modules and peripherals, following established basic procedures for system assembly and disassembly of field replaceable modules.
27.0 Diagnose and troubleshoot common module problems and system malfunctions of computer software, hardware, peripherals, and other office equipment.
28.0 Identify issues, procedures and devices for protection within the computing environment, including people, hardware and the surrounding workspace.
29.0 Identify specific terminology, facts, ways and means of dealing with classifications, categories and principles of motherboards, processors and memory in desktop and server computer systems.
30.0 Demonstrate knowledge of basic types of printers, basic concepts, printer components, how they work, how they print onto a page, paper path, care and service techniques, and common problems.
31.0 Identify and describe basic network concepts and terminology, ability to determine whether a computer is networked, knowledge of procedures for swapping and configuring network interface cards, and knowledge of the ramifications of repairs when a computer is networked.
32.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, remote access, or direct contact.
33.0 Demonstrate proficiency using graphical user interface (GUI) operating systems.
34.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
35.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, remote access, or direct contact.
36.0 Understand, describe, and explain internet connections.
37.0 Define networking terminology.
38.0 Explain how to connect copper media, optical media, and wireless media.
39.0 Perform tasks related to the network cable testing and cable making.
40.0 Define network topologies, devices and connections.
41.0 Define Ethernet fundamentals and operations.
42.0 Define and explain the functions of bridges and switches.
43.0 Explain the mathematical concepts and protocols behind the internet.
44.0 Define and explain the difference between routed and routing protocols.
45.0 Recognize, define, and explain functions of the transport layer.
46.0 Explain, define, and identify the components of a WAN and router.
47.0 Describe and identify an operating system for a router.
48.0 Explain how to establish connections between neighboring routers.

49.0 Identify and explain the router boot sequence and file system.
50.0 Identify and explain static and dynamic routing protocols.
51.0 Describe and configure distance vector protocols.
52.0 Perform tasks related to protocol troubleshooting.
53.0 Examine and test networks.
54.0 Define, explain and describe access lists.
55.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
56.0 Participate in work-based learning experiences.
57.0 Provide network support and assistance by troubleshooting and diagnosing through direct contact remote access.
58.0 Develop electronic communications skills.
59.0 Perform logical and physical network design activities.
60.0 Demonstrate proficiency in selecting appropriate various routing protocols and IP routing configuration for various network designs.
61.0 Demonstrate proficiency in using network traffic filtering to improve network performance and provide basic levels of security.
62.0 Perform network management activities related to documentation, security, performance, administration, troubleshooting and coping with environmental factors.
63.0 Identify and describe various van functions, devices, and demonstrate understanding of the wan design process.
64.0 Describe the operation and implementation of virtual private networks.
65.0 Participate in work-based learning experiences.
66.0 Compare and contrast hierarchical network design models and scalable internetworks.
67.0 Discuss advanced IP addressing management.
68.0 Demonstrate proficiency in basic router configuration.
69.0 Demonstrate proficiency in the use of OSPF.
70.0 Understand and discuss multi-area OSPF operation and configuration.
71.0 Demonstrate the use of stub and totally stubby areas.
72.0 Configure and define virtual links.
73.0 Demonstrate proficiency in the use of EIGRP.
74.0 Demonstrate proficiency in route optimization.
75.0 Demonstrate proficiency in the use of BGP.
76.0 Define and show proficiency in security.
77.0 Use lab equipment, demonstrate the setup, configuration, connectivity of routers to create a small WAN.
78.0 Show the process of using modems and asynchronous dialup connections.
79.0 Configure and verify PPP configurations.
80.0 Configure and monitor ISDN and DDR.
81.0 Configure dialer profiles.
82.0 Create and troubleshoot X.25 configurations.
83.0 Configure and troubleshoot frame relay.
84.0 Demonstrate the use of WAN backup and dial backup.
85.0 Demonstrate the use of queuing and compression techniques.
86.0 Demonstrate the use of scaling IP addresses with NAT.
87.0 Demonstrate proficiency using AAA to scale access control.
88.0 Discuss and explain emerging remote-access technologies.
89.0 Demonstrate proficiency configuring a 700 series router.
90.0 Understand and describe key characteristics of various switching technologies, LAN switching and the hierarchical model of network design, and the building-block approach.

91.0 Understand and describe campus networks, design models, and switching technologies.
92.0 List and describe various types of LAN media.
93.0 Show proficiency configuring a switch.
94.0 Demonstrate proficiency configuring VLANS.
95.0 Understand and explain spanning tree protocol (STP) AND redundant links.
96.0 Demonstrate proficiency routing between VLANS.
97.0 Demonstrate proficiency with multilayer switching.
98.0 Demonstrate the use of hot standby routing protocol (HSRP).
99.0 Understand and use IGMP and multicasting.
100.0 Demonstrate proficiency restricting network access.
101.0 Demonstrate proficiency using network troubleshooting tools and basic network management diagnostic tools.
102.0 List and define the commonly used protocols, routing techniques, and switching processes
103.0 Demonstrate proficiency troubleshooting TCP/IP, LAN switch environment, VLANS, frame relay, and ISDN.
104.0 Demonstrate proficiency configuring and trouble shooting IPX and APPLETALK.
105.0 Demonstrate proficiency troubleshooting EIGRP, OSPF, and BGP.
106.0 Participate in work-based learning experiences.
107.0 Demonstrate proficiency in applying radio frequency (RF) technologies.
108.0 Develop an awareness of wireless LAN technologies.
109.0 Perform implementation and management activities.
110.0 Develop an awareness of wireless security systems.
111.0 Demonstrate knowledge of wireless industry standards.
112.0 Participate in work-based learning experiences.
113.0 Demonstrate knowledge of general security concepts.
114.0 Develop an awareness of communication security concepts.
115.0 Develop an awareness of network infrastructure security.
116.0 Develop an awareness of cryptography and its relation to security.
117.0 Incorporate organizational and operational security in an appropriate and effective manner.
118.0 Demonstrate language arts knowledge and skills.
119.0 Demonstrate mathematics knowledge and skills.
120.0 Demonstrate science knowledge and skills.
121.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
122.0 Solve problems using critical thinking skills, creativity and innovation.
123.0 Use information technology tools.
124.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
125.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
126.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
127.0 Describe the importance of professional ethics and legal responsibilities.
128.0 Explain the importance of employability skill and entrepreneurship skills.
129.0 Demonstrate personal money-management concepts, procedures, and strategies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Network Support Services**
PSAV Number: **B078000**

Course Number: OTA0040
Occupational Completion Point – A
Information Technology Assistant – 150 Hours – SOC Code 15-1041

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Demonstrate basic file management skills.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 03.01 Select and use word processing software and accompanying features to enhance written business communications.
- 03.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.
- 03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

07.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
07.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
07.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
07.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

08.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

08.01 Accept constructive criticism.
08.02 Apply appropriate strategies to manage and resolve conflict in work situations.
08.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

09.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
09.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic file management skills.
01.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

02.01 Take notes, organize, summarize, and paraphrase ideas and details.
02.02 Accurately follow written and oral instructions.
02.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
03.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

04.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
04.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

05.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
05.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
05.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
06.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
06.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

07.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
07.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

07.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

08.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
08.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
08.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
08.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
08.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
08.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
08.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
08.08 Build mentor relationships with local professionals in the industry.

09.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

09.01 Accept constructive criticism.
09.02 Apply appropriate strategies to manage and resolve conflict in work situations.
09.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

10.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

11.0 Perform e-mail activities. – The student will be able to:

11.01 Describe e-mail capabilities and functions.
11.02 Use the Internet to perform e-mail activities.

12.0 Demonstrate operating systems. – The student will be able to:

12.01 Identify operating system file naming conventions.

12.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
12.03 Demonstrate a working knowledge of standard file formats.
12.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

13.0 Develop an awareness of emerging technologies. – The student will be able to:

13.01 Compare and contrast various methods of evaluation for emerging technologies.
13.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
13.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance-The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic computer file management skills.
01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills-The student will be able to:

02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
02.02 Write clear and well-organized research papers, integrating a variety of information.
02.03 Prepare and deliver an oral report with appropriate materials to the class
02.04 Participate in large group discussions as a member and/or a leader.
02.05 Take notes, organize, summarize, and paraphrase ideas and details.
02.06 Accurately follow written and oral instructions.
02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills-The student will be able to:

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles-The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace-The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance-The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance-The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals-The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals-The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up). (LA.C.3.4.4)
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace-The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance-The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities–The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems–The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies-The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Introduction to Information Technology competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance — The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills — The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

- 03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
- 03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles — The student will be able to:

- 04.01 Explore, design, implement, and evaluate organizational structures and cultures.
- 04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
- 04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace — The student will be able to:

- 05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
- 05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance — The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance — The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals — The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals — The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace — The student will be able to:

10.01 Accept constructive criticism.
10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences — The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.
12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.
12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the www – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).

14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using HTML commands – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the WWW – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software - The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry - The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers - The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages - The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies - The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the open systems interface (OSI) model - The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications - The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications - The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

Course Number: EEV0504
Occupational Completion Point – B
Computer Support Assistant – 150 Hours – SOC Code 15-1041

25.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance - The student will be able to:

25.01 Develop strategies for resolving customer conflicts.

26.0 Identify, install, configure, and upgrade desktop and server computer modules and peripherals, following established basic procedures for system assembly and disassembly of field replaceable modules - The student will be able to:

26.01 Identify and describe the functions of main processing boards (e.g., CPUs, RAM, ROM, bus architecture).
26.02 Identify and describe the functions of communication ports (e.g., serial and parallel ports).
26.03 Identify and describe the functions of peripheral devices (e.g., scanners, modems, hard drives, printers.
26.04 Identify and describe the components of portable systems (e.g., battery, LCD, AC adapter, PDAs).
26.05 Troubleshoot, install and upgrade computers and peripherals.
26.06 Perform system hardware setup Demonstrate an understanding of input/output devices.
26.07 Installation and configuration of applications software, hardware, and device drivers.
26.08 Demonstrate an understanding of the operation and purpose of hardware components.
26.09 Install operating system software.
26.10 Customize operating systems.
26.11 Install application software.
26.12 Perform storage formatting and preparation activities.
26.13 Identify data measurement (e.g., bits, bytes, kilobytes).

26.14 Install and Configure RAID.
26.15 Recognize and report on server room environmental issues (temperature, humidity/ESD/power surges, back-up).

27.0 Diagnose and troubleshoot common module problems and system malfunctions of computer software, hardware, peripherals, and other office equipment - The student will be able to:

27.01 Troubleshoot a personal computer system
27.02 Identify configuration problems.
27.03 Identify software problems.
27.04 Identify hardware malfunctions.
27.05 Identify network malfunctions
27.06 Resolve computer error messages.
27.07 Understand and troubleshoot memory and cache systems.
27.08 Verify that drives are the appropriate type.
27.09 Describe knowledge database search procedures used to identify possible solutions when troubleshooting software and hardware problems.

28.0 Identify issues, procedures and devices for protection within the computing environment, including people, hardware and the surrounding workspace - The student will be able to:

28.01 Apply basic rules for hardware safety.
28.02 Demonstrate proficiency in basic preventative hardware maintenance.
28.03 Special disposal procedures that comply with environmental guidelines for batteries, CRTs, toner kits/cartridges, chemical solvents and cans, and MSDS.
28.04 Apply ergonomic principles applicable to the configuration of computer workstations.
28.05 Describe ethical issues and problems associated with computers and information systems.

29.0 Identify specific terminology, facts, ways and means of dealing with classifications, categories and principles of motherboards, processors and memory in desktop and server computer systems - The student will be able to:

29.01 Identify EDO RAM, DRAM, SRAM, RIMM, VRAM, SDRAM, and WRAM.
29.02 Identify memory banks, memory chips (8-bit, 16-bit, and 32-bit), SIMMS (Single In-line Memory Module), DIMMS (Dual In-line Memory Module), parity chips versus non-parity chips.
29.03 Identify printer parallel port, COM/serial port, floppy drive, hard drive, Memory, and Boot sequence.

30.0 Demonstrate knowledge of basic types of printers, basic concepts, printer components, how they work, how they print onto a page, paper path, care and service techniques, and common problems - The student will be able to:

30.01 Identify types of printers—Laser, Inkjet, Dot Matrix.
30.02 Identify care and service techniques and common problems with primary printer types.
30.03 Implement and manage printing on a network.

31.0 Identify and describe basic network concepts and terminology, ability to determine whether a computer is networked, knowledge of procedures for swapping and configuring network interface cards, and knowledge of the ramifications of repairs when a computer is networked - The student will be able to:

31.01 Define networking and describe the purpose of a network.
31.02 Identify the purposes and interrelationships among the major components of networks (e.g., servers, clients, transmission media, network operating system, network boards).
31.03 Describe the various types of network topologies.
31.04 Identify and describe the purpose of standards, protocols, and the Open Systems Interconnection (OSI) reference model.
31.05 Configure network and verify network connectivity.
31.06 Discuss the responsibilities of the network administrator (e.g., rights and responsibilities).
31.07 Develop user logon procedures.
31.08 Utilize network management infrastructures (e.g., network monitoring, alerting, security) to perform administrative tasks.
31.09 Identify common backup strategies and procedures.
31.10 Select and use appropriate electronic communications software and hardware for specific tasks.
31.11 Compare and contrast Internet software and protocols.
31.12 Diagnose and resolve electronic communications operational problems.
31.13 Design and implement directory tree structures.
31.14 Install services tools (SNMP, backup software)
31.15 Perform full backup and verify backup
31.16 Identify bottlenecks (e.g., processor, bus transfer, I/O, disk I/O, network I/O, memory).
31.17 Use the concepts of fault tolerance/fault recovery to create a disaster recovery plan.
31.18 Document and test disaster recovery plan regularly, and update as needed.

32.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, internet, remote access, or direct contact - The student will be able to:

32.01 Apply call center vocabulary.
32.02 Listen and input information simultaneously.
32.03 Apply first response assistance for minor repair work.

33.0 Demonstrate proficiency using graphical user interface (GUI) operating systems - The student will be able to:

33.01 Identify parts of GUI windows.
33.02 Create and use icons.
33.03 Demonstrate proficiency in using menu systems.
33.04 Demonstrate proficiency in using pointing and selection devices.
33.05 Identify keyboard shortcuts and special function keys.
33.06 Demonstrate proficiency in manipulating windows.
33.07 Utilize help systems and hypertext links.
33.08 Create, organize, and maintain file system directories.
33.09 Organize desktop objects.

33.10 Run multiple applications.

118.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

118.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
118.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
118.03 Present information formally and informally for specific purposes and audiences. AF2.9

119.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

119.01 Demonstrate knowledge of arithmetic operations. AF3.2
119.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
119.03 Construct charts/tables/graphs using functions and data. AF3.5

120.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

120.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
120.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

Course Number: CTS0022
Occupational Completion Point – C
Network Support Help Desk Assistant – 150 Hours – SOC Code 15-1071

34.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance - The student will be able to:

34.01 Develop diplomatic methods to communicate with customers.

35.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, remote access, or direct contact - The student will be able to:

35.01 Apply first response assistance for minor repair work.

36.0 Understand, describe, and explain internet connections - The student will be able to:

36.01 Understand the physical connectivity necessary for a computer to connect to the Internet.
36.02 Recognize the primary components of a computer.
36.03 Install and troubleshoot network interface cards and/or modems.
36.04 Use basic testing procedures to test the Internet connection.
36.05 Demonstrate a basic understanding of the use of Web browsers and plug-ins.

37.0 Define networking terminology - The student will be able to:

37.01 Explain the importance of bandwidth in networking.

37.02 Identify bps, kbps, Mbps, and Gbps as units of bandwidth.
37.03 Explain the difference between bandwidth and throughput.
37.04 Explain the development of the Open System Interconnection model(OSI).
37.05 List the advantages of a layered approach.
37.06 Identify each of the seven layers of the OSI model.
37.07 Identify the four layers of the TCP/IP model.
37.08 Describe the similarities and differences between the two models.
37.09 Briefly outline the history of networking.
37.10 Identify devices used in networking.
37.11 Understand the role of protocols in networking.
37.12 Define LAN, WAN, MAN, and SAN.
37.13 Explain VPNs and their advantages.
37.14 Describe the differences between intranets and extranets.

38.0 Explain how to connect copper media, optical media, and wireless media - The student will be able to:

38.01 Discuss the electrical properties of matter.
38.02 Define voltage, resistance, impedance, current, and circuits.
38.03 Describe the specifications and performances of different types of cable.
38.04 Describe coaxial cable and its advantages and disadvantages over other types of cable.
38.05 Describe shielded twisted-pair (STP) cable and unshielded twisted-pair cable and its uses.
38.06 Describe (UTP) and their uses.
38.07 Discuss the characteristics of straight-through, crossover, and rollover cables and where each is used.
38.08 Explain the basics of fiber-optic cable.
38.09 Describe how fibers can guide light for long distances.
38.10 Describe multimode and single-mode fiber.
38.11 Describe how fiber is installed.
38.12 Describe the type of connectors and equipment used with fiber-optic cable.
38.13 Explain how fiber is tested to ensure that it will function properly.
38.14 Discuss safety issues dealing with fiber-optics.

39.0 Perform tasks related to the network cable testing and cable making **-** The student will be able to:

39.01 Differentiate between sine waves and square waves.
39.02 Define and calculate exponents and logarithms.
39.03 Define and calculate decibels.
39.04 Define basic terminology related to time, frequency, a noise.
39.05 Differentiate between digital bandwidth and analog bandwidth.
39.06 Compare and contrast noise levels on various types of cabling.
39.07 Define and describe the affects of attenuation and impedance mismatch.
39.08 Define crosstalk, near-end crosstalk, far-end crosstalk, and power sum near-end crosstalk.
39.09 Describe how crosstalk and twisted pairs help reduce noise.
39.10 Describe the ten copper cable tests defined in TIA/EIA-568-B.
39.11 Describe the difference between Category 5 and Category 6 cable.

40.0 Define network topologies, devices and connections–The student will be able to perform tasks related to the following:

40.01 Identify characteristics of Ethernet networks.
40.02 Identify straight-through, crossover, and rollover cable
40.03 Describe the function, advantages, and disadvantages of repeaters, hubs, bridges, switches, and wireless network components.
40.04 Describe the function of peer-to-peer networks.
40.05 Describe the function, advantages, and disadvantages of client-server networks.
40.06 Describe and differentiate between serial, Integrated Services Digital Network (ISDN), digital subscriber line (DSL), and cable modem WAN connections.
40.07 Identify router serial ports and their cable and connectors.
40.08 Identify and describe the placement of equipment used in various WAN configurations.

41.0 Define Ethernet fundamentals and operations - The student will be able to:

41.01 Describe the basics of Ethernet technology.
41.02 Explain naming rules of Ethernet technology.
41.03 Define how Ethernet and the OSI model interact.
41.04 Describe the Ethernet framing process and frame structure.
41.05 List Ethernet frame field names and purposes.
41.06 Identify the characteristics of CSMA/CD.
41.07 Describe the key aspects of Ethernet timing, interframe spacing and backoff time after a collision.
41.08 Define Ethernet errors and collisions.
41.09 Explain the concept of auto-negotiation in relation to speed and duplex.

42.0 Define and explain the functions of bridges and switches - The student will be able to:

42.01 Define bridging and switching.
42.02 Define and describe the content-addressable memory (CAM) table.
42.03 Define latency.
42.04 Describe store-and forward and cut-through switching modes.
42.05 Explain Spanning-Tree Protocol (STP).
42.06 Define collisions, broadcasts, collision domains, and broadcast domains.
42.07 Identify the Layer 1, 2, and 3 devices used to create collision domains and broadcast domains.
42.08 Discuss data flow and problems with broadcasts.
42.09 Explain network segmentation and list the devices used to create segments.

43.0 Explain the mathematical concepts and protocols behind the internet - The student will be able to:

43.01 Explain why the Internet was developed and how TCP/IP fits the design of the Internet.
43.02 List the four layers of the TCP/IP model.
43.03 Describe the functions of each layer of the TCP/IP model.
43.04 Compare the OSI model and the TCP/IP model.
43.05 Describe the function and structure of IP addresses.
43.06 Understand why subnetting is necessary.

43.07 Explain the difference between public and private addressing.
43.08 Understand the function of reserved IP addresses.
43.09 Explain the use of static and dynamic addressing for a device.
43.10 Understand how dynamic addressing can be done using RARP, BootP and DHCP.
43.11 Use ARP to obtain the MAC address to send a packet to another device.
43.12 Understand the issues related to addressing between networks.

44.0 Define and explain the difference between routed and routing protocols - The student will be able to:

44.01 Describe routed (routable) protocols.
44.02 List the steps of data encapsulation in an internetwork as data is routed to one or more Layer 3 devices.
44.03 Describe connectionless and connection-oriented delivery.
44.04 Name the IP packet fields.
44.05 Describe process of routing.
44.06 Compare and contrast different types of routing protocols.
44.07 List and describe several metrics used by routing protocols.
44.08 List several uses for subnetting.
44.09 Determine the subnet mask for a given situation.
44.10 Use a subnet mask to determine the subnet ID.

45.0 Recognize, define, and explain functions of the transport layer - The student will be able to:

45.01 Describe the functions of the TCP/IP transport layer.
45.02 Describe flow control.
45.03 Describe the processes of establishing a connection between peer systems.
45.04 Describe windowing.
45.05 Describe acknowledgment.
45.06 Identify and describe transport layer protocols.
45.07 Describe TCP and UDP header formats.
45.08 Describe TCP and UDP port numbers and ports used for services and clients.
45.09 List the major protocols of the TCP/IP application layer.
45.10 Provide a brief description of the features and operation of well-known TCP/IP applications.
45.11 Describe TCP and UDP with its function.
45.12 Describe TCP synchronization and flow control.
45.13 Describe multiple conversations between hosts.
45.14 Understand the differences and the relationship between MAC addresses, IP addresses, and port numbers.

46.0 Explain, define, and identify the components of a wan and router - The student will be able to:

46.01 Identify organizations responsible for WAN standards.
46.02 Explain the difference between a WAN and LAN and the type of addresses each uses.
46.03 Describe the role of a router in a WAN.
46.04 Identify internal components of the router and describe their functions.

46.05 Describe the physical characteristics of the router.
46.06 Identify common ports on a router.
46.07 Properly connect FastEthernet, serial WAN, and console ports.

47.0 Describe and identify an operating system for a router - The student will be able to:

47.01 Describe the purpose of the IOS.
47.02 Describe the basic operation of the IOS.
47.03 Identify various IOS features.
47.04 Identify the methods to establish a CLI session with the router.
47.05 Move between the user EXEC and privileged EXEC modes.
47.06 Establish a HyperTerminal session on a router.
47.07 Log into a router.
47.08 Use the help feature in the command line interface.
47.09 Troubleshoot command errors.
47.10 Name a router.
47.11 Set passwords.
47.12 Examine show commands.
47.13 Configure a serial interface.
47.14 Configure an Ethernet interface.
47.15 Execute changes to a router.
47.16 Save changes to a router.
47.17 Configure an interface description.
47.18 Configure a message-of-the-day banner.
47.19 Configure host tables.
47.20 Understand the importance of backups and documentation.

48.0 Explain how to establish connections between neighboring routers - The student will be able to:

48.01 Enable and disable Protocols.
48.02 Determine which neighboring devices are connected to which local interfaces.
48.03 Gather network address information about neighboring devices using CDP.
48.04 Establish, Verify, Disconnect, Suspend a Telnet connection.
48.05 Perform alternative connectivity tests.
48.06 Troubleshoot remote terminal connections.

49.0 Identify and explain the router boot sequence and file system - The student will be able to:

49.01 Identify the stages of the router boot sequence.
49.02 Determine how a router locates and loads its operating system.
49.03 Use the boot system command.
49.04 Identify the configuration register values.
49.05 Briefly describe the files used by the Router IOS and their functions.
49.06 List the locations on the router of the different file types.
49.07 Briefly describe the parts of the IOS name.
49.08 Save and restore configuration files using TFTP and copy-and paste.
49.09 Load an IOS image using TFTP.
49.10 Load an IOS image using XModem.
49.11 Verify the file system using show commands.

50.0 Identify and explain static and dynamic routing protocols - The student will be able to:

- 50.01 Explain the significance of static routing.
- 50.02 Configure static and default routes.
- 50.03 Verify and troubleshoot static and default routes.
- 50.04 Identify the classes of routing protocols.
- 50.05 Identify distance vector routing protocols.
- 50.06 Identify link-state routing protocols.
- 50.07 Describe the basic characteristics of common routing protocols.
- 50.08 Identify interior gateway protocols.
- 50.09 Identify exterior gateway protocols.
- 50.10 Enable Routing Information Protocol (RIP) on a router.

51.0 Describe and configure distance vector protocols - The student will be able to:

- 51.01 Describe how routing loops can occur in distance vector routing.
- 51.02 Describe several methods used by distance vector routing protocols to ensure that routing information is accurate.
- 51.03 Configure RIP.
- 51.04 Use the IP classless command.
- 51.05 Troubleshoot RIP.
- 51.06 Configure RIP for load balancing.
- 51.07 Configure static routes for RIP.
- 51.08 Verify RIP.
- 51.09 Configure IGRP.
- 51.10 Verify IGRP operation.
- 51.11 Troubleshoot IGRP.

52.0 Perform tasks related to protocol troubleshooting - The student will be able to:

- 52.01 Describe ICMP.
- 52.02 Describe the ICMP message format and error message types.
- 52.03 Identify potential causes of specific ICMP error messages.
- 52.04 Describe ICMP control messages.
- 52.05 Identify a variety of ICMP control messages used in networks today.
- 52.06 Determine the causes for ICMP control messages.

53.0 Examine and test networks- - The student will be able to:

- 53.01 Use the commands to gather detailed information about the routes installed on the router.
- 53.02 Configure a default route or default network.
- 53.03 Understand how a router uses both Layer 2 and Layer addressing to move data through the network.
- 53.04 Use commands to the router at different OSI layers.

54.0 Define, explain and describe access lists - The student will be able to:

- 54.01 Describe the differences between standard and extended ACLs.
- 54.02 Explain the rules for placement of ACLs.

54.03 Create and apply named ACLs.
54.04 Describe the function of firewalls.
54.05 Use ACLs to restrict virtual terminal access.

121.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

121.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
121.02 Locate, organize and reference written information from various sources. CM 3.0
121.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
121.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
121.05 Apply active listening skills to obtain and clarify information. CM 7.0
121.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
121.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

122.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

122.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
122.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
122.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
122.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

123.0 Use information technology tools. – The student will be able to:

123.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
123.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
123.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
123.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

124.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

124.01 Describe the nature and types of business organizations. SY 1.0
124.02 Explain the effect of key organizational systems on performance and quality.
124.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
124.04 Explain the impact of the global economy on business organizations.

127.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

127.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
127.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
127.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
127.04 Interpret and explain written organizational policies and procedures. ELR 2.0

Course Number: CTS0023
Occupational Completion Point – D
Network Support Administrator – 150 Hours – SOC Code 15-1071

55.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance - The student will be able to:

55.01 Develop diplomatic methods to communicate with customers.

56.0 Participate in work-based learning experiences - The student will be able to:

56.01 Participate in work-based learning experiences in a network support services environment.
56.02 Discuss the use of technology in a network support services environment.

57.0 Provide network support and assistance by troubleshooting and diagnosing through direct contact remote access - The student will be able to:

57.01 Apply appropriate diagnostic techniques to solve network problems.
57.02 Perform local network support using various troubleshooting and diagnostic techniques.
57.03 Perform remote network support using various remote access methods.

58.0 Develop electronic communications skills - The student will be able to:

58.01 Exhibit proficiency in using Internet services.
58.02 Exhibit proficiency in downloading and uploading Internet information.
58.03 Perform web-based research to solve specific network problems.

59.0 Perform logical and physical network design activities - The student will be able to:

59.01 Describe the various LAN communication problems.
59.02 Describe the effects of LAN segmentation with bridges, routers, and switches.
59.03 Describe the operation, characteristics and benefits of VLANS.
59.04 Explain and identify LAN design goals, issues, and methodology.
59.05 Demonstrate the ability to analyze equipment necessary to meet specific design requirement.
59.06 Demonstrate the ability to create physical and logical network implementation documentation.

60.0 Demonstrate proficiency in selecting appropriate various routing protocols and ip routing configuration for various network designs - The student will be able to:

60.01 Describe the two parts of network addressing, and then identify the parts in specific protocol address examples.
60.02 Create the different classes of IP addresses [and sub netting].
60.03 Configure IP addresses.
60.04 Verify IP addresses.
60.05 Identify the functions of the TCP/IP transport-layer protocols.
60.06 Identify the functions of the TCP/IP network-layer protocols.
60.07 Identify the functions performed by ICMP.
60.08 Configure IPX access lists and SAP filters to control traffic.
60.09 Explain the services of separate and integrated multi-protocol routing.
60.10 List problems that each routing type encounters when dealing with topology changes and describe techniques to reduce the number of these problems.

61.0 Demonstrate proficiency in using network traffic filtering to improve network performance and provide basic levels of security - The student will be able to:

61.01 Define and describe the purpose and operation of network traffic filtering.
61.02 Demonstrate proficiency in using configuration and interface perform commands to and monitor network traffic filtering.

62.0 Perform network management activities related to documentation, security, performance, administration, troubleshooting and coping with environmental factors - The student will be able to:

62.01 Perform documentation activities for networks, such as logs, journals, diagrams, labeling schemes, layouts, software listings, user policy, security policy.
62.02 Plan network security measures by establishing security policies and procedures, including user policies, authentication procedures, back-up and data recovery procedures, and redundancy techniques.
62.03 Demonstrate proficiency in using network monitoring software.
62.04 Explain the procedures necessary to monitor, create benchmarks, and plan for improvement of network performance.
62.05 Explain the administrative side of network management, including physical and logical boundaries, costs, error report documentation and the management of human resources.

63.0 Identify and describe various wan functions, devices, and demonstrate understanding of the wan design process - The student will be able to:

63.01 Describe the functions of private addressing and be able to explain the major features of and configure NAT, PAT, and DHCP.
63.02 Describe the major features of WAN technology, including, devices, standards, encapsulation, link options, and packet and circuit switching.
63.03 Perform WAN design activities that require using the necessary steps in WAN design, the three-layered design model, and various other design models.

64.0 Describe the operation and implementation of virtual private networks - The student will be able to:

64.01 Describe the virtual private network operation.

64.02 Describe the virtual private network implementation.
64.03 Demonstrate an understanding of tunneling.
64.04 Describe the end-to-end virtual dialup process.

125.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

125.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
125.02 Explain emergency procedures to follow in response to workplace accidents.
125.03 Create a disaster and/or emergency response plan. SHE 2.0

126.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

126.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
126.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
126.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
126.04 Employ mentoring skills to inspire and teach others. LT 5.0

128.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

128.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
128.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
128.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
128.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
128.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
128.06 Identify and exhibit traits for retaining employment. ECD 7.0
128.07 Identify opportunities and research requirements for career advancement. ECD 8.0
128.08 Research the benefits of ongoing professional development. ECD 9.0
128.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

129.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

129.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
129.02 Describe the effect of money management on personal and career goals. FL 3.0
129.03 Develop a personal budget and financial goals. FL3.1
129.04 Complete financial instruments for making deposits and withdrawals. FL3.2
129.05 Maintain financial records. FL3.3
129.06 Read and reconcile financial statements. FL3.4
129.07 Research, compare and contrast investment opportunities.

Course Number: CTS0024
Occupational Completion Point – E
Senior Network Administrator – 150 Hours – SOC Code 15-1071

65.0 Participate in work-based learning experiences – The student will be able to:

65.01 Participate in work-based learning experiences in a network support services environment.
65.02 Discuss the use of technology in a network support services environment.

66.0 Compare and contrast hierarchical network design models and scalable internetworks – The student will be able to:

66.01 Show proficiency in the use of the three-layer hierarchical design model.
66.02 Describe router functions in the core layer, distribution layer, and access layer.
66.03 Describe key characteristics of making the network reliable, available, responsive, efficient, adaptable, accessible, scalable and secure.
66.04 Compare and contrast Equal-Cost load balancing with RIP and Unequal-Cost load balancing with IGRP.

67.0 Discuss advanced ip addressing management - The student will be able to:

67.01 Describe and explain IPv4 addressing, Internet's address architecture, classes of IP addresses, and perform subnet masking.
67.02 Understand and explain Classless Interdomain Routing (CIDR), route aggregation, supernetting and address allocation.
67.03 Discuss and explain Variable-Length Subnet Masks along with classless and classfull routing protocols.
67.04 Compare and contrast route summarization and route flapping.
67.05 Describe and discuss Network Address Translation (NAT), private addressing with NAT, private IP addresses (RFC 1918) and discontiguous subnets.
67.06 Use IP unnumbered and DHCP operations
67.07 Configure IOS DHCP server, Easy IP and IP helper addresses
67.08 Discuss IP addressing crisis and solutions with IPv6 address formats.
67.09 Configure IP unnumbered in a lab setting.

68.0 Demonstrate proficiency in basic router configuration – The student will be able to:

68.01 Build ‘Start.TXT’, capture hyperterminal and telnet sessions, create access control list and extended pings, and configure VLSM using routing fundamentals.
68.02 Configure static routing and dynamic routing using distance-vector routing protocols, link-state routing protocols, and hybrid routing.
68.03 Configure static default routes and default routing with IGRP using default route caveats and floating static routes
68.04 Describe and explain convergence issues and route calculation fundamentals.
68.05 Start routing process using various configurations, initiate routing updates and routing metrics.
68.06 Show proficiency in migrating from RIP to EIGRP.
68.07 Configuring default routing with RIP and IGRP, configuring floating static routes.

69.0 Demonstrate proficiency in the use of OSPF – The student will be able to:

69.01 Discuss issues addressed by the use OSPF, list and define OSPF terminology, list OSPF states and OSPF network types, describe OSPF Hello protocol and Steps of OSPF operation.
69.02 Establish router adjacencies, elect a DR and a BDR, and discover routes.
69.03 Select appropriate routes and maintain routing information configuring OSPF on routers within a single area.
69.04 Use optional configuration commands and configure OSPF over NBMA in a lab setting.
69.05 Describe Full-Mesh Frame Relay, Partial-Mesh Frame Relay, Point-to-Multipoint OSPF.

70.0 Understand and discuss multi-area OSPF operation and configuration - The student will be able to:

70.01 Configure OSPF, examining the DR/BDR election process
70.02 Configure Point-to-Multipoint OSPF over frame relay, create
70.03 multiple OSPF areas, use OSPF router types, and incorporate
70.04 OSPF LSA and area types.
70.05 Configuring OSPF operation across multiple areas and flooding LSUs to multiple areas, updating the routing table
70.06 Configure Multi-area OSPF, using and configuring OSPF, multi-area components, and configuring OSPF route summarization.
70.07 Verify OSPF operation, show commands, clear and debug commands.

71.0 Demonstrate the use of stub and totally stubby areas – The student will be able to:

71.01 Use stub and totally stubby areas.
71.02 Set up stub and totally stub area criteria.
71.03 Configure stub and totally stubby areas.
71.04 Set up a OSPF stub area configuration example.
71.05 Set up a OSPF totally stubby configuration example.
71.06 Monitor multi-area OSPF, verifying multi-area OSPF operation
71.07 Create a multi-area OSPF.

72.0 Configure and define virtual links - The student will be able to:

72.01 Meet the backbone area requirements.
72.02 Configure virtual links.
72.03 Set up a virtual link configuration example.
72.04 Show not-so-stubby areas.
72.05 Demonstrate how NSSA operates.
72.06 Configure a stub area and a totally stubby area.
72.07 Configure an NSSA and configure virtual links.

73.0 Demonstrate proficiency in the use of EIGRP – The student will be able to:

73.01 Define and explain EIGRP fundamentals, features, components, operations.
73.02 Configure and monitor EIGRP in lab exercise.

74.0 Demonstrate proficiency in route optimization – The student will be able to:

74.01 Show how to control routing updates, policy routing, and route redistribution.
74.02 Create a route optimization configuration in lab setting.

75.0 Demonstrate proficiency in the use of BGP – The student will be able to:

75.01 Define and explain autonomous systems and basic BGP operations.
75.02 Configure and monitor BGP operations and routing process.
75.03 Define and explain BGP attributes and the BGP decision process.
75.04 Create BGP configuration in lab setting.
75.05 Develop a scaling BGP and route reflectors.
75.06 Set up BGP route filtering and policy routing.
75.07 Explain the community attribute and peer groups.
75.08 Explain redundancy, symmetry, and load balancing.
75.09 Define and explain BGP redistribution.
75.10 Perform scaling BGP lab exercises and configure BGP in a lab setting.

76.0 Define and show proficiency in security – The student will be able to:

76.01 Show proficiency in securing router access using access lists.
76.02 Show proficiency in using dynamic access lists using lock-and-key.
76.03 Show proficiency in session filtering.
76.04 Define and explain context-based access control.
76.05 Use an alternative to access lists.
76.06 Configure router security in a lab setting.

77.0 Using lab equipment, demonstrate the setup, configuration, connectivity of routers to create a small WAN - The student will be able to:

77.01 Demonstrate the use of remote access.
77.02 Select appropriate WAN technologies for different scenarios.
77.03 Select remote access solutions for different technologies.
77.04 Assemble and Cable WAN components.

78.0 Show the process of using modems and asynchronous dialup connections - The student will be able to:

78.01 List, describe and verify modem functions.
78.02 Configure asynchronous interfaces and terminal lines.
78.03 Demonstrate proficiency in the creation of modem configurations.
78.04 Configuring a Windows PC dialup connection.
78.05 Use dialup connection configurations.

79.0 Configure and verify PPP configurations – The student will be able to:

79.01 Demonstrate the use of PPP authentication, PPP callback, PPP compression, and PPP multilink.
79.02 Create and verifying PPP configurations.

80.0 Configure and monitor ISDN and DDR – The student will be able to:

80.01 Explain and discuss ISDN architecture and ISDN protocol layers.

80.02 Configure ISDN BRI Dial-on-Demand, static routing and default routing, and ISDN PRI.
80.03 Create optional configurations.
80.04 Monitor the ISDN interface.
80.05 Create ISDN configurations.

81.0 Configure dialer profiles – The student will be able to:

81.01 Demonstrate the use of Legacy DDR.
81.02 Create and use various dialer profiles.
81.03 Verify and monitor dialer profiles configurations.

82.0 Create and trouble-shoot x.25 configurations - The student will be able to:

82.01 Show proficiency in the use of X.25 concepts.
82.02 Configure and Trouble-shoot X.25.

83.0 Configure and trouble-shoot frame relay - The student will be able to:

83.01 Show proficiency using frame relay concepts.
83.02 Configure frame relay.
83.03 Create various frame relay topologies and configurations.
83.04 Demonstrate proficiency managing frame relay traffic.
83.05 Show the process of frame relay traffic shaping.
83.06 Create on demand routing using frame relay.
83.07 Trouble-shoot frame relay traffic configurations**.**

84.0 Demonstrate the use of WAN backup and dial backup – The student will be able to:

84.01 Demonstrate dial backup.
84.02 Demonstrate backup interface operations.
84.03 Demonstrate routing with the load backup feature.
84.04 Verifying dial backup configurations in a lab setting.
84.05 Create various WAN backup configurations in a lab setting.

85.0 Demonstrate the use of queuing and compression techniques – The student will be able to:

85.01 Demonstrate proficiency using various queuing options.
85.02 Demonstrate proficiency optimizing traffic flow with data compression.

86.0 Demonstrate the use of scaling IP addresses with NAT – The student will be able to:

86.01 Define and explain NAT concepts and terminology.
86.02 Demonstrate proficiency in configuring, creating and verifying NAT configurations in lab setting.

87.0 Demonstrate proficiency using AAA to scale access control - The student will be able to:

87.01 List and define AAA concepts and terminology.
87.02 Demonstrate proficiency configuring AAA.

87.03 Perform lab exercises using access control configurations**.**

88.0 Discuss and explain emerging remote-access technologies - The student will be able to:

88.01 List and define features and capabilities of cable, modems wireless, network access, multichannel multipoint distribution services, local multipoint distribution services, wireless local area networking, very-high-data-rate digital subscriber line (VDSL).

89.0 Demonstrate proficiency configuring a 700 series router – The student will be able to:

89.01 Use a series router.
89.02 Configure the 700 Series router in a lab setting.
89.03 Use various IOS configurations in a lab setting.

90.0 Understand and describe key characteristics of various switching technologies, LAN switching and the hierarchical model of network design, and the building-block approach - The student will be able to:

90.01 Discuss the requirements of the evolving campus structure and the issues with traditional network designs.
90.02 Describe the fundamental campus elements and contributing variables to campus networks.
90.03 Compare and contrast the traditional 80/20 rule of network traffic and the new 20/80 rule of network traffic.
90.04 Discuss switching and the OSI model, layer 2, 3, and 4 switching, and multiplayer switching.
90.05 Discuss the core layer, the distribution layer, and the access layer in relation to switching.
90.06 List and describe the advantages and disadvantages of the building-block approach, scaling the switch block, building the core block and layer 2 and 3 backbone scaling.

91.0 Understand and describe campus networks, design models, and switching technologies - The student will be able to:

91.01 List and explain key characteristics of various switching technologies.
91.02 Discuss LAN switching and the hierarchical model of network design.
91.03 Show proficiency using the building-block approach to networking.

92.0 List and describe various types of LAN media – The student will be able to:

92.01 Show proficiency using modem functions and maintaining modem auto-configurations.
92.02 Create configurations for asynchronous connections.
92.03 Create various modem configurations.

93.0 Show proficiency configuring a switch - The student will be able to:

93.01 Demonstrate the process for initial connectivity to a switch.
93.02 Show proficiency creating the basic configuration of a switch.

93.03 List and explain important IOS features.

94.0 Demonstrate proficiency configuring VLANS – The student will be able to:

94.01 Understand and explain VLANs.
94.02 Discuss VLAN basics and VLAN types.
94.03 Configure a VLAN in a lab setting.
94.04 Show use of VLAN identification techniques and VLAN trunking protocol.
94.05 Create VTP configuration and use VTP pruning.

95.0 Understand and explain spanning tree protocol (STP) and redundant links – The student will be able to:

95.01 Discuss Basic STP Operations and STP Processes.
95.02 Compare and contrast VLANs and STP.
95.03 Show how STP is used in the Campus Network.
95.04 Demonstrate the resolution of Redundant Links

96.0 Demonstrate proficiency routing between VLANS – The student will be able to:

96.01 Understand and discuss VLAN issues.
96.02 Route switch modules.
96.03 Show proficiency using external routers in a lab setting.

97.0 Demonstrate proficiency with multilayer switching – The student will be able to:

97.01 Define and explain MLS Processes.
97.02 Create basic MLS configurations.
97.03 Show proficiency using flow masks.
97.04 Show how to use MLS on the switch.

98.0 Demonstrate the use of hot standby routing protocol (HSRP) - The student will be able to:

98.01 Define and explain HSRP operations.
98.02 Create HSRP configurations in a lab setting.

99.0 Understand and use IGMP and multicasting – The student will be able to:

99.01 Define and explain multicasting.
99.02 Understand and discuss IGMP.
99.03 Show proficiency routing multicast traffic.
99.04 Demonstrate proficiency using multicast routing protocols.
99.05 Configure IP multicast routing in a lab setting.
99.06 List and describe optional IP multicast routing tasks**.**

100.0 Demonstrate proficiency restricting network access - The student will be able to:

100.01 Show proficiency creating networking policies.
100.02 Discuss and explain basic network security techniques.
100.03 Demonstrate execution of policy configurations on a set of routers.

101.0 Demonstrate proficiency using network troubleshooting tools and basic network management diagnostic tools – The student will be able to:

101.01 Explain and discuss troubleshooting methodologies and general problem-solving concepts.
101.02 List and define general considerations in troubleshooting.
101.03 Define and explain each component of the general problem-solving model.
101.04 Demonstrate proficiency using common management and diagnostic tools.
101.05 Show proficiency using network management software.
101.06 Demonstrate proficiency using router diagnostic commands.
101.07 Familiarize logging and error message formats.
101.08 Demonstrate proficiency interacting with technical support.

102.0 List and define the commonly used protocols, routing techniques, and switching processes – The student will be able to:

102.01 List and define network services, layer 2 LAN protocols, and layer 2 WAN protocols.
102.02 Race packets through a router.
102.03 Define and explain packet switching paths.
102.04 Identify performance issues affecting packet switching.
102.05 Define and explain low-level troubleshooting.

103.0 Demonstrate proficiency troubleshooting TCP/IP, LAN switch environment, VLANS, frame relay, and ISDN – The student will able to:

103.01 List, define, and explain theory, concepts, and terminology of TCP/IP, LAN switch environment, spanning tree, VLANs, frame relay, and ISDN.
103.02 List, define, and explain common problems with TCP/IP, LAN switching, and ISDN.
103.03 List, define, and explain common scenarios with VLANs, frame relay, and ISDN.
103.04 Troubleshoot TCP/IP in a Windows environment; use LAN switch troubleshooting tools, explain general VLAN troubleshooting issues; list and explain the steps in frame relay troubleshooting and ISDN problem isolation.
103.05 Use show commands to verify LAN switch configuration settings.
103.06 Use show and debug commands for TCP/IP, router VLANs, frame relay, and ISDN.
103.07 Use TCP/IP diagnostic tools.

104.0 Demonstrate proficiency configuring and trouble shooting IPX and APPLETALK – The student will be able to:

104.01 List, define, and explain theory, concepts, and terminology of IPX and AppleTalk.
104.02 Demonstrate proficiency configuring IPX and AppleTalk.
104.03 Demonstrate proficiency trouble shooting IPX and AppleTalk.
104.04 Demonstrate proficiency using show and debug command with IPX and AppleTalk.

105.0 Demonstrate proficiency troubleshooting EIGRP, OSPF, and BGP – The student will be able to:

105.01 List, define, and explain theory, concepts, and terminology of EIGRP, OSPF, and BGP.
105.02 Demonstrate proficiency configuring AAA, EIGRP, OSPF, and BGP.
105.03 Demonstrate proficiency trouble shooting EIGRP, OSPF, and BGP.
105.04 Demonstrate proficiency using the show and debug commands for OSPF and BGP.

Course Number: CTS0029
Occupational Completion Point – F
Wireless Network Administrator – 150 Hours – SOC Code 15-1081

106.0 Participate in work-based learning experiences – The student will be able to:

106.01 Participate in work-based learning experiences in a network support services environment.
106.02 Discuss the use of technology in a network support services environment.
106.03 Discuss the management/supervisory skills needed in a network support service environment.

107.0 Demonstrate proficiency in applying radio frequency (RF) technologies - The student will be able to:

107.01 Define and apply the basic concepts of RF behavior.
107.02 Understand the applications of basic RF antenna concepts.
107.03 Understand and apply the basic components of RF
107.04 Identify some of the different uses for spread spectrum technologies.
107.05 Comprehend the differences between, and apply the different types of spread spectrum technologies.
107.06 Identify and apply the concepts which make up the functionality of spread spectrum technology.
107.07 Identify the laws set forth by the FCC that govern spread spectrum technology, including power outputs, frequencies, bandwidths, hop times, and dwell times.

108.0 Develop an awareness of wireless LAN technologies — The student will be able to:

108.01 Identify and apply the processes involved in authentication and association.
108.02 Recognize the concepts associated with wireless LAN service sets.
108.03 Understand the implications of the following power management features of wireless LANs.
108.04 Specify the modes of operation involved in the movement of data traffic across wireless LANs.

109.0 Perform implementation and management activities — The student will be able to:

109.01 Identify the technology roles for which wireless LAN technology is an appropriate technology application.
109.02 Identify the purpose of infrastructure devices and explain how to install, configure, and manage them.

109.03 Identify the purpose of wireless LAN client devices and explain how to install, configure, and manage them.
109.04 Identify the purpose of wireless LAN gateway devices and explain how to install, configure, and manage them.
109.05 Identify the basic attributes, purpose, and function of types of antennas.
109.06 Describe the proper locations and methods for installing antennas.
109.07 Explain the concepts of polarization, gain, beamwidth, and free-space path loss as they apply to implementing solutions that require antennas.
109.08 Identify the use of wireless LAN accessories and explain how to install, configure, and manage them.
109.09 Identify, understand, correct or compensate for wireless LAN implementation challenges.
109.10 Explain how antenna diversity compensates for multipath.
109.11 Identify and understand the importance and process of conducting a thorough site survey.
109.12 Identify and understand the importance of the necessary tasks involved in preparing to do an RF site survey.
109.13 Identify the necessary equipment involved in performing a site survey.
109.14 Understand the necessary procedures involved in performing a site survey.
109.15 Identify and understand site survey reporting procedures**.**

110.0 Develop an awareness of wireless security systems - The student will be able to:

110.01 Identify the strengths, weaknesses and appropriate uses of wireless LAN security techniques.
110.02 Describe types of wireless LAN security attacks, and explain how to identify and prevent them.
110.03 Given a wireless LAN scenario, identify the appropriate security solution from the following available wireless LAN security solutions.
110.04 Explain the uses of corporate security policies and how they are used to secure a wireless LAN.
110.05 Identify how and security precautions are used to secure a wireless LAN.

111.0 Demonstrate knowledge of wireless industry standards — The student will be able to:

111.01 Identify, apply and comprehend the differences between wireless LAN standards.
111.02 Understand the roles of organizations in providing direction and accountability within the wireless LAN industry.
111.03 Identify the differences between the ISM and UNII bands.
111.04 Identify and understand the differences between the power output rules for point-to-point and point-to-multipoint links.
111.05 Identify the basic characteristics of infrared wireless LANs.

Course Number: EEV0317
Occupational Completion Point – G
Data Communication Analyst – 150 Hours – SOC Code 15-1081

112.0 Participate in work-based learning experiences – The student will be able to:

112.01 Participate in work-based learning experiences in a network support services environment.
112.02 Discuss the use of technology in a network support services environment.
112.03 Discuss the management/supervisors skills needed in a network support services environment.

113.0 Demonstrate a knowledge of general security concepts — The student will be able to:

113.01 Describe access control.
113.02 Describe network authentication.
113.03 Understand the various types of network attacks (backdoors, DOS, spoofing, etc.)
113.04 Identify and modify non-essential services and protocols.
113.05 Identify malicious code (virus, worm, Trojan).
113.06 Configure system auditing, logging, and scanning as it relates to security procedures.

114.0 Develop an awareness of communication security concepts — The student will be able to:

114.01 Describe remote access protocols (VPN, RADIUS, L2TP, etc.).
114.02 Identify E-mail security concerns (hoaxes, spam, etc.).
114.03 Identify web (HTML) security concepts and designs (HTTP/S, IM, etc.).
114.04 Demonstrate an awareness of file transfer security concerns.
114.05 Describe and identify wireless networking security concerns and vulnerabilities.

115.0 Develop an awareness of network infrastructure security — The student will be able to:

115.01 Install and configure network firewalls.
115.02 Identify security concerns with various wiring media (copper, fiber).
115.03 Identify security concerns associated with removable media and storage devices.
115.04 Demonstrate an awareness of security topologies (security zones, Intranets, NAT, etc.).
115.05 Configure and use intrusion detection software.
115.06 Establish security baselines (updates, patches, hot fixes, Access Control lists, etc.).
115.07 Demonstrate the ability to configure a Virtual Private Network (VPN).
115.08 Describe the function of Network Address Translation (NAT**).**

116.0 Develop an awareness of cryptography and its relation to security — The student will be able to:

116.01 Demonstrate an understanding of security algorithms and encryption.
116.02 Use and apply Public Key Certificates.
116.03 Demonstrate an understanding of standards and protocols in commerce.

117.0 Incorporate organizational and operational security in an appropriate and effective manner — The student will be able to:

117.01 Describe how to establish a network security policy.
117.02 Explain the importance of physical security to protect network resources.

117.03 Identify and use disaster recovery procedures.
117.04 Describe the importance of business continuity and its relationship to network and corporate security.
117.05 Describe security policies and procedures that would be used in a business environment.
117.06 Explain the importance of privilege management (access, password management, sign-on, etc.).
117.07 Describe the concept of forensics as it applies to network security (obtaining evidence of security breaches).
117.08 Explain the importance of educating users and supervisors in regard to network security.
117.09 Create documentation that describes standards and guidelines for a network security system.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Keyboarding and Business Skills**
Course Number: **8200320**
Course Credit: **.5**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental word processing applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society.

This course, along with Computer and Business Skills is equivalent to Computing for College and Careers. Students should complete this course before enrolling in Computer and Business Skills.

10.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 10.01 Develop keyboarding skills to enter and manipulate text and data.
- 10.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 10.03 Demonstrate basic file management skills.

11.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 11.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 11.02 Write clear and well-organized research papers, integrating a variety of information.
- 11.03 Prepare and deliver an oral report with appropriate materials to the class
- 11.04 Participate in large group discussions as a member and/or a leader.
- 11.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 11.06 Accurately follow written and oral instructions.
- 11.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

12.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 12.01 Select and use word processing software and accompanying features to enhance written business communications.
- 12.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.

12.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

13.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

13.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
13.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
13.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

14.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

14.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
14.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

15.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

15.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
15.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
15.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

16.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

16.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
16.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.

16.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
16.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

17.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

17.01 Accept constructive criticism.
17.02 Apply appropriate strategies to manage and resolve conflict in work situations.
17.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

18.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
18.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer and Business Skills**
Course Number: **8200330**
Course Credit: **.5**

Course Description:

This course is designed to introduce students to the basic skills and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

This course, along with Keyboarding and Business Skills is equivalent to Computing for College and Careers. Students should complete Keyboarding and Business Skills before enrolling in this course.

14.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 14.01 Develop keyboarding skills to enter and manipulate text and data.
- 14.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 14.03 Identify and describe communications and networking systems used in workplace environments.
- 14.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 14.05 Demonstrate basic file management skills.
- 14.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
- 14.07 Describe ethical issues and problems associated with computers and information systems.
- 14.08 Apply ergonomic principles applicable to the configuration of computer workstations.

15.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

- 15.01 Take notes, organize, summarize, and paraphrase ideas and details.
- 15.02 Accurately follow written and oral instructions.
- 15.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

16.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

16.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
16.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
16.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

17.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

17.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
17.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

18.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
18.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
18.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

19.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

19.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
19.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
19.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

20.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

20.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
20.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

20.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

21.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

21.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
21.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
21.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
21.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
21.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
21.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
21.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
21.08 Build mentor relationships with local professionals in the industry.

22.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

22.01 Accept constructive criticism.
22.02 Apply appropriate strategies to manage and resolve conflict in work situations.
22.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

23.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

23.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

24.0 Perform e-mail activities. – The student will be able to:

24.01 Describe e-mail capabilities and functions.
24.02 Use the Internet to perform e-mail activities.

25.0 Demonstrate operating systems. – The student will be able to:

25.01 Identify operating system file naming conventions.

25.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
25.03 Demonstrate a working knowledge of standard file formats.
25.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

26.0 Develop an awareness of emerging technologies. – The student will be able to:

26.01 Compare and contrast various methods of evaluation for emerging technologies.
26.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
26.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computing for College and Careers**
Course Number: **8209020**
Course Credit: **1**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society. This also includes proficiency with computers using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance-The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Demonstrate basic computer file management skills.
- 01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.07 Describe ethical issues and problems associated with computers and information systems.
- 01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills-The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills-The student will be able to:

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles-The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace-The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance-The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance-The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals-The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals-The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up). (LA.C.3.4.4)
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace-The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance-The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities–The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems–The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies-The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Introduction to Information Technology**
Course Number: **8207310**
Course Credit: **1**

Course Description:

This course is designed to provide an introduction to information technology concepts and careers as well as the impact information technology has on the world, people, and industry and basic web design concepts. The content includes information technology career research; operating systems and software applications; electronic communications including e-mail and Internet services; basic HTML, DHTML, and XML web commands and design; and emerging technologies and web page design.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance — The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills — The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles — The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace — The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance — The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance — The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals — The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals — The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace — The student will be able to:

10.01 Accept constructive criticism.
10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences — The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.
12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.

12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the Internet, intranet, and the WWW – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using HTML commands – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the WWW – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software - The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry - The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers - The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages - The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies - The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model - The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications - The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications - The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Networking 1**
Course Number: **8207020**
Course Credit: **1**

Course Description:

This course is designed to develop competencies needed for employment in network support positions. The content includes instruction in basic hardware configuration, hardware and software troubleshooting, operating systems, and computer networking.

25.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance - The student will be able to:

25.01 Develop strategies for resolving customer conflicts.

26.0 Identify, install, configure, and upgrade desktop and server computer modules and peripherals, following established basic procedures for system assembly and disassembly of field replaceable modules - The student will be able to:

26.01 Identify and describe the functions of main processing boards (e.g., CPUs, RAM, ROM, bus architecture).
26.02 Identify and describe the functions of communication ports (e.g., serial and parallel ports).
26.03 Identify and describe the functions of peripheral devices (e.g., scanners, modems, hard drives, printers.
26.04 Identify and describe the components of portable systems (e.g., battery, LCD, AC adapter, PDAs).
26.05 Troubleshoot, install and upgrade computers and peripherals.
26.06 Perform system hardware setup Demonstrate an understanding of input/output devices.
26.07 Installation and configuration of applications software, hardware, and device drivers.
26.08 Demonstrate an understanding of the operation and purpose of hardware components.
26.09 Install operating system software.
26.10 Customize operating systems.
26.11 Install application software.
26.12 Perform storage formatting and preparation activities.
26.13 Identify data measurement (e.g., bits, bytes, kilobytes).
26.14 Install and Configure RAID.
26.15 Recognize and report on server room environmental issues (temperature, humidity/ESD/power surges, back-up).

27.0 Diagnose and troubleshoot common module problems and system malfunctions of computer software, hardware, peripherals, and other office equipment - The student will be able to:

27.01 Troubleshoot a personal computer system
27.02 Identify configuration problems.
27.03 Identify software problems.
27.04 Identify hardware malfunctions.
27.05 Identify network malfunctions
27.06 Resolve computer error messages.
27.07 Understand and troubleshoot memory and cache systems.
27.08 Verify that drives are the appropriate type.
27.09 Describe knowledge database search procedures used to identify possible solutions when troubleshooting software and hardware problems.

28.0 Identify issues, procedures and devices for protection within the computing environment, including people, hardware and the surrounding workspace - The student will be able to:

28.01 Apply basic rules for hardware safety.
28.02 Demonstrate proficiency in basic preventative hardware maintenance.
28.03 Special disposal procedures that comply with environmental guidelines for batteries, CRTs, toner kits/cartridges, chemical solvents and cans, and MSDS.
28.04 Apply ergonomic principles applicable to the configuration of computer workstations.
28.05 Describe ethical issues and problems associated with computers and information systems**.**

29.0 Identify specific terminology, facts, ways and means of dealing with classifications, categories and principles of motherboards, processors and memory in desktop and server computer systems — The student will be able to:

29.01 Identify EDO RAM, DRAM, SRAM, RIMM, VRAM, SDRAM, and WRAM.
29.02 Identify memory banks, memory chips (8-bit, 16-bit, and 32-bit), SIMMS (Single In-line Memory Module), DIMMS (Dual In-line Memory Module), parity chips versus non-parity chips.
29.03 Identify printer parallel port, COM/serial port, floppy drive, hard drive, Memory, and Boot sequence.

30.0 Demonstrate knowledge of basic types of printers, basic concepts, printer components, how they work, how they print onto a page, paper path, care and service techniques, and common problems - The student will be able to:

30.01 Identify types of printers—Laser, Inkjet, Dot Matrix.
30.02 Identify care and service techniques and common problems with primary printer types.
30.03 Implement and manage printing on a network.

31.0 Identify and describe basic network concepts and terminology, ability to determine whether a computer is networked, knowledge of procedures for swapping and configuring network interface cards, and knowledge of the ramifications of repairs when a computer is networked - The student will be able to:

31.01 Define networking and describe the purpose of a network.

31.02 Identify the purposes and interrelationships among the major components of networks (e.g., servers, clients, transmission media, network operating system, network boards).
31.03 Describe the various types of network topologies.
31.04 Identify and describe the purpose of standards, protocols, and the Open Systems Interconnection (OSI) reference model.
31.05 Configure network and verify network connectivity.
31.06 Discuss the responsibilities of the network administrator (e.g., rights and responsibilities).
31.07 Develop user logon procedures.
31.08 Utilize network management infrastructures (e.g., network monitoring, alerting, security) to perform administrative tasks.
31.09 Identify common backup strategies and procedures.
31.10 Select and use appropriate electronic communications software and hardware for specific tasks.
31.11 Compare and contrast Internet software and protocols.
31.12 Diagnose and resolve electronic communications operational problems.
31.13 Design and implement directory tree structures.
31.14 Install services tools (SNMP, backup software)
31.15 Perform full backup and verify backup
31.16 Identify bottlenecks (e.g., processor, bus transfer, I/O, disk I/O, network I/O, memory).
31.17 Use the concepts of fault tolerance/fault recovery to create a disaster recovery plan.
31.18 Document and test disaster recovery plan regularly, and update as needed.

32.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, internet, remote access, or direct contact - The student will be able to:

32.01 Apply call center vocabulary.
32.02 Listen and input information simultaneously.
32.03 Apply first response assistance for minor repair work.

33.0 Demonstrate proficiency using graphical user interface (GUI) operating systems - The student will be able to:

33.01 Identify parts of GUI windows.
33.02 Create and use icons.
33.03 Demonstrate proficiency in using menu systems.
33.04 Demonstrate proficiency in using pointing and selection devices.
33.05 Identify keyboard shortcuts and special function keys.
33.06 Demonstrate proficiency in manipulating windows.
33.07 Utilize help systems and hypertext links.
33.08 Create, organize, and maintain file system directories.
33.09 Organize desktop objects.
33.10 Run multiple applications.

118.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

118.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4

118.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
118.03 Present information formally and informally for specific purposes and audiences. AF2.9

119.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

119.01 Demonstrate knowledge of arithmetic operations. AF3.2
119.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
119.03 Construct charts/tables/graphs using functions and data. AF3.5

120.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

120.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
120.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Networking 2, Infrastructure**
Course Number: **8207030**
Course Credit: **1**

Course Description:

This course focuses on understanding network terminology and protocols, local-area networks, wide-area networks, OSI models, cabling, cabling tools, routers, router programming, Ethernet, IP addressing and network standards.

34.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance - The student will be able to:

34.01 Develop diplomatic methods to communicate with customers.

35.0 Perform end user support and assistance by troubleshooting and diagnosing through telephone, e-mail, remote access, or direct contact - The student will be able to:

35.01 Apply first response assistance for minor repair work.

36.0 Understand, describe, and explain internet connections - The student will be able to:

36.01 Understand the physical connectivity necessary for a computer to connect to the Internet.
36.02 Recognize the primary components of a computer.
36.03 Install and troubleshoot network interface cards and/or modems.
36.04 Use basic testing procedures to test the Internet connection.
36.05 Demonstrate a basic understanding of the use of Web browsers and plug-ins.

37.0 Define networking terminology - The student will be able to:

37.01 Explain the importance of bandwidth in networking.
37.02 Identify bps, kbps, Mbps, and Gbps as units of bandwidth.
37.03 Explain the difference between bandwidth and throughput.
37.04 Explain the development of the Open System Interconnection model(OSI).
37.05 List the advantages of a layered approach.
37.06 Identify each of the seven layers of the OSI model.
37.07 Identify the four layers of the TCP/IP model.
37.08 Describe the similarities and differences between the two models.
37.09 Briefly outline the history of networking.
37.10 Identify devices used in networking.
37.11 Understand the role of protocols in networking.
37.12 Define LAN, WAN, MAN, and SAN.
37.13 Explain VPNs and their advantages.
37.14 Describe the differences between intranets and extranets.

38.0 Explain how to connect copper media, optical media, and wireless media - The student will be able to:

38.01 Discuss the electrical properties of matter.
38.02 Define voltage, resistance, impedance, current, and circuits.
38.03 Describe the specifications and performances of different types of cable.
38.04 Describe coaxial cable and its advantages and disadvantages over other types of cable.
38.05 Describe shielded twisted-pair (STP) cable and unshielded twisted-pair cable and its uses.
38.06 Describe (UTP) and their uses.
38.07 Discuss the characteristics of straight-through, crossover, and rollover cables and where each is used.
38.08 Explain the basics of fiber-optic cable.
38.09 Describe how fibers can guide light for long distances.
38.10 Describe multimode and single-mode fiber.
38.11 Describe how fiber is installed.
38.12 Describe the type of connectors and equipment used with fiber-optic cable.
38.13 Explain how fiber is tested to ensure that it will function properly.
38.14 Discuss safety issues dealing with fiber-optics.

39.0 Perform tasks related to the network cable testing and cable making - The student will be able to:

39.01 Differentiate between sine waves and square waves.
39.02 Define and calculate exponents and logarithms.
39.03 Define and calculate decibels.
39.04 Define basic terminology related to time, frequency, a noise.
39.05 Differentiate between digital bandwidth and analog bandwidth.
39.06 Compare and contrast noise levels on various types of cabling.
39.07 Define and describe the affects of attenuation and impedance mismatch.
39.08 Define crosstalk, near-end crosstalk, far-end crosstalk, and power sum near-end crosstalk.
39.09 Describe how crosstalk and twisted pairs help reduce noise.
39.10 Describe the ten copper cable tests defined in TIA/EIA-568-B.
39.11 Describe the difference between Category 5 and Category 6 cable.

40.0 Define network topologies, devices and connections – The student will be able to perform tasks related to the following:

40.01 Identify characteristics of Ethernet networks.
40.02 Identify straight-through, crossover, and rollover cable
40.03 Describe the function, advantages, and disadvantages of repeaters, hubs, bridges, switches, and wireless network components.
40.04 Describe the function of peer-to-peer networks.
40.05 Describe the function, advantages, and disadvantages of client-server networks.
40.06 Describe and differentiate between serial, Integrated Services Digital Network (ISDN), digital subscriber line (DSL), and cable modem WAN connections.
40.07 Identify router serial ports and their cable and connectors.
40.08 Identify and describe the placement of equipment used in various WAN configurations.

41.0 Define Ethernet fundamentals and operations - The student will be able to:

41.01 Describe the basics of Ethernet technology.
41.02 Explain naming rules of Ethernet technology.
41.03 Define how Ethernet and the OSI model interact.
41.04 Describe the Ethernet framing process and frame structure.
41.05 List Ethernet frame field names and purposes.
41.06 Identify the characteristics of CSMA/CD.
41.07 Describe the key aspects of Ethernet timing, interframe spacing and backoff time after a collision.
41.08 Define Ethernet errors and collisions.
41.09 Explain the concept of auto-negotiation in relation to speed and duplex.

42.0 Define and explain the functions of bridges and switches - The student will be able to:

42.01 Define bridging and switching.
42.02 Define and describe the content-addressable memory (CAM) table.
42.03 Define latency.
42.04 Describe store-and forward and cut-through switching modes.
42.05 Explain Spanning-Tree Protocol (STP).
42.06 Define collisions, broadcasts, collision domains, and broadcast domains.
42.07 Identify the Layer 1, 2, and 3 devices used to create collision domains and broadcast domains.
42.08 Discuss data flow and problems with broadcasts.
42.09 Explain network segmentation and list the devices used to create segments.

43.0 Explain the mathematical concepts and protocols behind the internet - The student will be able to:

43.01 Explain why the Internet was developed and how TCP/IP fits the design of the Internet.
43.02 List the four layers of the TCP/IP model.
43.03 Describe the functions of each layer of the TCP/IP model.
43.04 Compare the OSI model and the TCP/IP model.
43.05 Describe the function and structure of IP addresses.
43.06 Understand why subnetting is necessary.
43.07 Explain the difference between public and private addressing.
43.08 Understand the function of reserved IP addresses.
43.09 Explain the use of static and dynamic addressing for a device.
43.10 Understand how dynamic addressing can be done using RARP, BootP and DHCP.
43.11 Use ARP to obtain the MAC address to send a packet to another device.
43.12 Understand the issues related to addressing between networks.

44.0 Define and explain the difference between routed and routing protocols - The student will be able to:

44.01 Describe routed (routable) protocols.
44.02 List the steps of data encapsulation in an internetwork as data is routed to one or more Layer 3 devices.

44.03 Describe connectionless and connection-oriented delivery.
44.04 Name the IP packet fields.
44.05 Describe process of routing.
44.06 Compare and contrast different types of routing protocols.
44.07 List and describe several metrics used by routing protocols.
44.08 List several uses for subnetting.
44.09 Determine the subnet mask for a given situation.
44.10 Use a subnet mask to determine the subnet ID.

45.0 Recognize, define, and explain functions of the transport layer - The student will be able to:

45.01 Describe the functions of the TCP/IP transport layer.
45.02 Describe flow control.
45.03 Describe the processes of establishing a connection between peer systems.
45.04 Describe windowing.
45.05 Describe acknowledgment.
45.06 Identify and describe transport layer protocols.
45.07 Describe TCP and UDP header formats.
45.08 Describe TCP and UDP port numbers and ports used for services and clients.
45.09 List the major protocols of the TCP/IP application layer.
45.10 Provide a brief description of the features and operation of well-known TCP/IP applications.
45.11 Describe TCP and UDP with its function.
45.12 Describe TCP synchronization and flow control.
45.13 Describe multiple conversations between hosts.
45.14 Understand the differences and the relationship between MAC addresses, IP addresses, and port numbers.

46.0 Explain, define, and identify the components of a WAN and router - The student will be able to:

46.01 Identify organizations responsible for WAN standards.
46.02 Explain the difference between a WAN and LAN and the type of addresses each uses.
46.03 Describe the role of a router in a WAN.
46.04 Identify internal components of the router and describe their functions.
46.05 Describe the physical characteristics of the router.
46.06 Identify common ports on a router.
46.07 Properly connect FastEthernet, serial WAN, and console ports.

47.0 Describe and identify an operating system for a router - The student will be able to:

47.01 Describe the purpose of the IOS.
47.02 Describe the basic operation of the IOS.
47.03 Identify various IOS features.
47.04 Identify the methods to establish a CLI session with the router.
47.05 Move between the user EXEC and privileged EXEC modes.
47.06 Establish a HyperTerminal session on a router.
47.07 Log into a router.
47.08 Use the help feature in the command line interface.

47.09 Troubleshoot command errors.
47.10 Name a router.
47.11 Set passwords.
47.12 Examine show commands.
47.13 Configure a serial interface.
47.14 Configure an Ethernet interface.
47.15 Execute changes to a router.
47.16 Save changes to a router.
47.17 Configure an interface description.
47.18 Configure a message-of-the-day banner.
47.19 Configure host tables.
47.20 Understand the importance of backups and documentation.

48.0 Explain how to establish connections between neighboring routers - The student will be able to:

48.01 Enable and disable Protocols.
48.02 Determine which neighboring devices are connected to which local interfaces.
48.03 Gather network address information about neighboring devices using CDP.
48.04 Establish, Verify, Disconnect, Suspend a Telnet connection.
48.05 Perform alternative connectivity tests.
48.06 Troubleshoot remote terminal connections.

49.0 Identify and explain the router boot sequence and file system - The student will be able to:

49.01 Identify the stages of the router boot sequence.
49.02 Determine how a router locates and loads its operating system.
49.03 Use the boot system command.
49.04 Identify the configuration register values.
49.05 Briefly describe the files used by the Router IOS and their functions.
49.06 List the locations on the router of the different file types.
49.07 Briefly describe the parts of the IOS name.
49.08 Save and restore configuration files using TFTP and copy-and paste.
49.09 Load an IOS image using TFTP.
49.10 Load an IOS image using XModem.
49.11 Verify the file system using show commands.

50.0 Identify and explain static and dynamic routing protocols - The student will be able to:

50.01 Explain the significance of static routing.
50.02 Configure static and default routes.
50.03 Verify and troubleshoot static and default routes.
50.04 Identify the classes of routing protocols.
50.05 Identify distance vector routing protocols.
50.06 Identify link-state routing protocols.
50.07 Describe the basic characteristics of common routing protocols.
50.08 Identify interior gateway protocols.
50.09 Identify exterior gateway protocols.
50.10 Enable Routing Information Protocol (RIP) on a router.

51.0 Describe and configure distance vector protocols - The student will be able to:

51.01 Describe how routing loops can occur in distance vector routing.
51.02 Describe several methods used by distance vector routing protocols to ensure that routing information is accurate.
51.03 Configure RIP.
51.04 Use the ip classless command.
51.05 Troubleshoot RIP.
51.06 Configure RIP for load balancing.
51.07 Configure static routes for RIP.
51.08 Verify RIP.
51.09 Configure IGRP.
51.10 Verify IGRP operation.
51.11 Troubleshoot IGRP.

52.0 Perform tasks related to protocol troubleshooting - The student will be able to:

52.01 Describe ICMP.
52.02 Describe the ICMP message format and error message types.
52.03 Identify potential causes of specific ICMP error messages.
52.04 Describe ICMP control messages.
52.05 Identify a variety of ICMP control messages used in networks today.
52.06 Determine the causes for ICMP control messages.

53.0 Examine and test networks - The student will be able to:

53.01 Use the commands to gather detailed information about the routes installed on the router.
53.02 Configure a default route or default network.
53.03 Understand how a router uses both Layer 2 and Layer addressing to move data through the network.
53.04 Use commands to the router at different OSI layers.

54.0 Define, explain and describe access lists - The student will be able to:

54.01 Describe the differences between standard and extended ACLs.
54.02 Explain the rules for placement of ACLs.
54.03 Create and apply named ACLs.
54.04 Describe the function of firewalls.
54.05 Use ACLs to restrict virtual terminal access.

121.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

121.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
121.02 Locate, organize and reference written information from various sources. CM 3.0
121.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
121.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0

121.05 Apply active listening skills to obtain and clarify information. CM 7.0
121.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
121.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

122.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

122.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
122.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
122.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
122.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

123.0 Use information technology tools. – The student will be able to:

123.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
123.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
123.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
123.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

124.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

124.01 Describe the nature and types of business organizations. SY 1.0
124.02 Explain the effect of key organizational systems on performance and quality.
124.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
124.04 Explain the impact of the global economy on business organizations.

127.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

127.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
127.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
127.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
127.04 Interpret and explain written organizational policies and procedures. ELR 2.0

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Networking 3, Infrastructure**
Course Number: **8207040**
Course Credit: **1**

Course Description:

This course continues the study of network support services. The content includes IT management skills, troubleshooting and diagnostic techniques; network design, devices, topographies, protocols and standards; e-mail and Internet activities, network traffic control and security, and WAN vs. LAN technologies.

55.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance - The student will be able to:

- 55.01 Develop diplomatic methods to communicate with customers.

56.0 Participate in work-based learning experiences - The student will be able to:

- 56.01 Participate in work-based learning experiences in a network support services environment.
- 56.02 Discuss the use of technology in a network support services environment.

57.0 Provide network support and assistance by troubleshooting and diagnosing through direct contact remote access - The student will be able to:

- 57.01 Apply appropriate diagnostic techniques to solve network problems.
- 57.02 Perform local network support using various troubleshooting and diagnostic techniques.
- 57.03 Perform remote network support using various remote access methods.

58.0 Develop electronic communications skills - The student will be able to:

- 58.01 Exhibit proficiency in using Internet services.
- 58.02 Exhibit proficiency in downloading and uploading Internet information.
- 58.03 Perform web-based research to solve specific network problems.

59.0 Perform logical and physical network design activities - The student will be able to:

- 59.01 Describe the various LAN communication problems.
- 59.02 Describe the effects of LAN segmentation with bridges, routers, and switches.
- 59.03 Describe the operation, characteristics and benefits of VLANS.
- 59.04 Explain and identify LAN design goals, issues, and methodology.
- 59.05 Demonstrate the ability to analyze equipment necessary to meet specific design requirement.
- 59.06 Demonstrate the ability to create physical and logical network implementation documentation.

60.0 Demonstrate proficiency in selecting appropriate various routing protocols and IP routing configuration for various network designs - The student will be able to:

60.01 Describe the two parts of network addressing, and then identify the parts in specific protocol address examples.
60.02 Create the different classes of IP addresses [and sub netting].
60.03 Configure IP addresses.
60.04 Verify IP addresses.
60.05 Identify the functions of the TCP/IP transport-layer protocols.
60.06 Identify the functions of the TCP/IP network-layer protocols.
60.07 Identify the functions performed by ICMP.
60.08 Configure IPX access lists and SAP filters to control traffic.
60.09 Explain the services of separate and integrated multi-protocol routing.
60.10 List problems that each routing type encounters when dealing with topology changes and describe techniques to reduce the number of these problems.

61.0 Demonstrate proficiency in using network traffic filtering to improve network performance and provide basic levels of security - The student will be able to:

61.01 Define and describe the purpose and operation of network traffic filtering.
61.02 Demonstrate proficiency in using configuration and interface commands to perform and monitor network traffic filtering.

62.0 Perform network management activities related to documentation, security, performance, administration, troubleshooting and coping with environmental factors - The student will be able to:

62.01 Perform documentation activities for networks, such as logs, journals, diagrams, labeling schemes, layouts, software listings, user policy, security policy.
62.02 Plan network security measures by establishing security policies and procedures, including user policies, authentication procedures, back-up and data recovery procedures, and redundancy techniques.
62.03 Demonstrate proficiency in using network monitoring software.
62.04 Explain the procedures necessary to monitor, create benchmarks, and plan for improvement of network performance.
62.05 Explain the administrative side of network management, including physical and logical boundaries, costs, error report documentation and the management of human resources.

63.0 Identify and describe various WAN functions, devices, and demonstrate understanding of the WAN design process - The student will be able to:

63.01 Describe the functions of private addressing and be able to explain the major features of and configure NAT, PAT, and DHCP.
63.02 Describe the major features of WAN technology, including, devices, standards, encapsulation, link options, and packet and circuit switching.
63.03 Perform WAN design activities that require using the necessary steps in WAN design, the three-layered design model, and various other design models.

64.0 Describe the operation and implementation of virtual private networks - The student will be able to:

64.01 Describe the virtual private network operation.
64.02 Describe the virtual private network implementation.
64.03 Demonstrate an understanding of tunneling.
64.04 Describe the end-to-end virtual dialup process.

125.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

125.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
125.02 Explain emergency procedures to follow in response to workplace accidents.
125.03 Create a disaster and/or emergency response plan. SHE 2.0

126.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

126.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
126.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
126.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
126.04 Employ mentoring skills to inspire and teach others. LT 5.0

128.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

128.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
128.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
128.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
128.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
128.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
128.06 Identify and exhibit traits for retaining employment. ECD 7.0
128.07 Identify opportunities and research requirements for career advancement. ECD 8.0
128.08 Research the benefits of ongoing professional development. ECD 9.0
128.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

129.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

129.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
129.02 Describe the effect of money management on personal and career goals. FL 3.0
129.03 Develop a personal budget and financial goals. FL3.1
129.04 Complete financial instruments for making deposits and withdrawals. FL3.2
129.05 Maintain financial records. FL3.3
129.06 Read and reconcile financial statements. FL3.4
129.07 Research, compare and contrast investment opportunities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Networking 4, Infrastructure**
Course Number: **8207050**
Course Credit: **1**

Course Description:

This course continues the study of network support services. The student will learn to install, configure, and maintain large networks. Student will also be able to demonstrate proficiency in defining, configuring and trouble shooting the following protocols: IP, IGRP, IPX, Async Routing, AppleTalk, Extended Access Lists, IP RIP, Route Redistribution, RIP, Route Summarization, OSPF, VLSM, BGP, Serial, Frame Relay, ISDN, ISL, X.25, DDR, PSTN, PPP, VLANs, Ethernet, Access Lists, 802.10, FDDI, Transparent and Translational Bridging installation.

65.0 Participate in work-based learning experiences - The student will be able to:

- 65.01 Participate in work-based learning experiences in a network support services environment.
- 65.02 Discuss the use of technology in a network support services environment.

66.0 Compare and contrast hierarchical network design models and scalable internetworks – The student will be able to:

- 66.01 Show proficiency in the use of the three-layer hierarchical design model.
- 66.02 Describe router functions in the core layer, distribution layer, and access layer.
- 66.03 Describe key characteristics of making the network reliable, available, responsive, efficient, adaptable, accessible, scalable and secure.
- 66.04 Compare and contrast Equal-Cost load balancing with RIP and Unequal-Cost load balancing with IGRP.

67.0 Discuss advanced IP addressing management - The student will be able to:

- 67.01 Describe and explain IPv4 addressing, Internet's address architecture, classes of IP addresses, and perform subnet masking.
- 67.02 Understand and explain Classless Interdomain Routing (CIDR), route aggregation, supernetting and address allocation.
- 67.03 Discuss and explain Variable-Length Subnet Masks along with classless and classful routing protocols.
- 67.04 Compare and contrast route summarization and route flapping.
- 67.05 Describe and discuss Network Address Translation (NAT), private addressing with NAT, private IP addresses (RFC 1918) and discontiguous subnets.
- 67.06 Use IP unnumbered and DHCP operations
- 67.07 Configure IOS DHCP server, Easy IP and IP helper addresses
- 67.08 Discuss IP addressing crisis and solutions with IPv6 address formats.
- 67.09 Configure IP unnumbered in a lab setting.

68.0 Demonstrate proficiency in basic router configuration – The student will be able to:

68.01 Build 'Start.TXT', capture hyperterminal and telnet sessions, create access control list and extended pings, and configure VLSM using routing fundamentals.
68.02 Configure static routing and dynamic routing using distance-vector routing protocols, link-state routing protocols, and hybrid routing.
68.03 Configure static default routes and default routing with IGRP using default route caveats and floating static routes
68.04 Describe and explain convergence issues and route calculation fundamentals.
68.05 Start routing process using various configurations, initiate routing updates and routing metrics.
68.06 Show proficiency in migrating from RIP to EIGRP.
68.07 Configuring default routing with RIP and IGRP, configuring floating static routes.

69.0 Demonstrate proficiency in the use of OSPF – The student will be able to:

69.01 Discuss issues addressed by the use OSPF, list and define OSPF terminology, list OSPF states and OSPF network types, describe OSPF Hello protocol and Steps of OSPF operation.
69.02 Establish router adjacencies, elect a DR and a BDR, and discover routes.
69.03 Select appropriate routes and maintain routing information, configuring OSPF on routers within a single area.
69.04 Use optional configuration commands and configure OSPF over NBMA in a lab setting.
69.05 Describe Full-Mesh Frame Relay, Partial-Mesh Frame Relay, Point-to-Multipoint OSPF.

70.0 Understand and discuss multi-area OSPF operation and configuration - The student will be able to:

70.01 Configure OSPF, examining the DR/BDR election process
70.02 Configure Point-to-Multipoint OSPF over frame relay, create multiple OSPF areas, use OSPF router types, and incorporate OSPF LSA and area types.
70.03 Configuring OSPF operation across multiple areas and flooding LSUs to multiple areas, updating the routing table
70.04 Configure Multi-area OSPF, using and configuring OSPF multi-area components, and configuring OSPF route summarization.
70.05 Verify OSPF operation, show commands, clear and debug commands.

71.0 Demonstrate the use of stub and totally stubby areas – The student will be able to:

71.01 Use stub and totally stubby areas.
71.02 Set up stub and totally stub area criteria.
71.03 Configure stub and totally stubby areas.
71.04 Set up a OSPF stub area configuration example.
71.05 Set up a OSPF totally stubby configuration example.
71.06 Monitor multi-area OSPF, verifying multi-area OSPF operation
71.07 Create a multi-area OSPF.

72.0 Configure and define virtual links - The student will be able to:

72.01 Meet the backbone area requirements.

72.02 Configure virtual links.
72.03 Set up a virtual link configuration example.
72.04 Show not-so-stubby areas.
72.05 Demonstrate how NSSA operates.
72.06 Configure a stub area and a totally stubby area.
72.07 Configure an NSSA and configure virtual links.

73.0 Demonstrate proficiency in the use of EIGRP – The student will be able to:

73.01 Define and explain EIGRP fundamentals, features, components, operations.
73.02 Configure and monitor EIGRP in lab exercise.

74.0 Demonstrate proficiency in route optimization – The student will be able to:

74.01 Show how to control routing updates, policy routing, and route redistribution.
74.02 Create a route optimization configuration in lab setting.

75.0 Demonstrate proficiency in the use of BGP – The student will be able to:

75.01 Define and explain autonomous systems and basic BGP operations.
75.02 Configure and monitor BGP operations and routing process.
75.03 Define and explain BGP attributes and the BGP decision process.
75.04 Create BGP configuration in lab setting.
75.05 Develop a scaling BGP and route reflectors.
75.06 Set up BGP route filtering and policy routing.
75.07 Explain the community attribute and peer groups.
75.08 Explain redundancy, symmetry, and load balancing.
75.09 Define and explain BGP redistribution.
75.10 Perform scaling BGP lab exercises and configure BGP in a lab setting.

76.0 Define and show proficiency in security – The student will be able to:

76.01 Show proficiency in securing router access using access lists.
76.02 Show proficiency in using dynamic access lists using lock-and-key.
76.03 Show proficiency in session filtering.
76.04 Define and explain context-based access control.
76.05 Use an alternative to access lists.
76.06 Configure router security in a lab setting.

77.0 Using lab equipment, demonstrate the setup, configuration, connectivity of routers to create a small WAN - The student will be able to:

77.01 Demonstrate the use of remote access.
77.02 Select appropriate WAN technologies for different scenarios.
77.03 Select remote access solutions for different technologies.
77.04 Assemble and Cable WAN components.

78.0 Show the process of using modems and asynchronous dialup connections - The student will be able to:

78.01 List, describe and verify modem functions.

78.02 Configure asynchronous interfaces and terminal lines.
78.03 Demonstrate proficiency in the creation of modem configurations.
78.04 Configuring a Windows PC dialup connection.
78.05 Use dialup connection configurations.

79.0 Configure and verify PPP configurations – The student will be able to:

79.01 Demonstrate the use of PPP authentication, PPP callback, PPP compression, and PPP multilink.
79.02 Create and verifying PPP configurations.

80.0 Configure and monitor ISDN and DDR – The student will be able to:

80.01 Explain and discuss ISDN architecture and ISDN protocol layers.
80.02 Configure ISDN BRI Dial-on-Demand, static routing and default routing, and ISDN PRI.
80.03 Create optional configurations.
80.04 Monitor the ISDN interface.
80.05 Create ISDN configurations.

81.0 Configure dialer profiles – The student will be able to:

81.01 Demonstrate the use of Legacy DDR.
81.02 Create and use various dialer profiles.
81.03 Verify and monitor dialer profiles configurations.

82.0 Create and trouble-shoot X.25 configurations - The student will be able to:

82.01 Show proficiency in the use of X.25 concepts.
82.02 Configure and Trouble-shoot X.25.

83.0 Configure and trouble-shoot frame relay - The student will be able to:

83.01 Show proficiency using frame relay concepts.
83.02 Configure frame relay.
83.03 Create various frame relay topologies and configurations.
83.04 Demonstrate proficiency managing frame relay traffic.
83.05 Show the process of frame relay traffic shaping.
83.06 Create on demand routing using frame relay.
83.07 Trouble-shoot frame relay traffic configurations.

84.0 Demonstrate the use of WAN backup and dial backup – The student will be able to:

84.01 Demonstrate dial backup.
84.02 Demonstrate backup interface operations.
84.03 Demonstrate routing with the load backup feature.
84.04 Verifying dial backup configurations in a lab setting.
84.05 Create various WAN backup configurations in a lab setting.

85.0 Demonstrate the use of queuing and compression techniques – The student will be able to:

85.01 Demonstrate proficiency using various queuing options.
85.02 Demonstrate proficiency optimizing traffic flow with data compression.

86.0 Demonstrate the use of scaling IP addresses with NAT – The student will be able to:

86.01 Define and explain NAT concepts and terminology.
86.02 Demonstrate proficiency in configuring, creating and verifying NAT configurations in lab setting.

87.0 Demonstrate proficiency using AAA to scale access control - The student will be able to:

87.01 List and define AAA concepts and terminology.
87.02 Demonstrate proficiency configuring AAA.
87.03 Perform lab exercises using access control configurations**.**

88.0 Discuss and explain emerging remote-access technologies - The student will be able to:

88.01 List and define features and capabilities of cable, modems, wireless, network access, multichannel multipoint distribution services, local multipoint distribution services, wireless local area networking, very-high-data-rate digital subscriber line (VDSL).

89.0 Demonstrate proficiency configuring a 700 series router – The student will be able to:

89.01 Use a series router.
89.02 Configure the 700 Series router in a lab setting.
89.03 Use various IOS configurations in a lab setting.

90.0 Understand and describe key characteristics of various switching technologies, LAN switching and the hierarchical model of network design, and the building-block approach - The student will be able to:

90.01 Discuss the requirements of the evolving campus structure and the issues with traditional network designs.
90.02 Describe the fundamental campus elements and contributing variables to campus networks.
90.03 Compare and contrast the traditional 80/20 rule of network traffic and the new 20/80 rule of network traffic.
90.04 Discuss switching and the OSI model, layer 2, 3, and 4 switching, and multiplayer switching.
90.05 Discuss the core layer, the distribution layer, and the access layer in relation to switching.
90.06 List and describe the advantages and disadvantages of the building-block approach, scaling the switch block, building the core block and layer 2 and 3 backbone scaling.

91.0 Understand and describe campus networks, design models, and switching technologies - The student will be able to:

91.01 List and explain key characteristics of various switching technologies.

91.02 Discuss LAN switching and the hierarchical model of network design.
91.03 Show proficiency using the building-block approach to networking.

92.0 List and describe various types of LAN media – The student will be able to:

92.01 Show proficiency using modem functions and maintaining modem auto-configurations.
92.02 Create configurations for asynchronous connections.
92.03 Create various modem configurations.

93.0 Show proficiency configuring a switch - The student will be able to:

93.01 Demonstrate the process for initial connectivity to a switch.
93.02 Show proficiency creating the basic configuration of a switch.
93.03 List and explain important IOS features.

94.0 Demonstrate proficiency configuring VLANS – The student will be able to:

94.01 Understand and explain VLANs.
94.02 Discuss VLAN basics and VLAN types.
94.03 Configure a VLAN in a lab setting.
94.04 Show use of VLAN identification techniques and VLAN trunking protocol.
94.05 Create VTP configuration and use VTP pruning.

95.0 Understand and explain spanning tree protocol (STP) and redundant links – The student will be able to:

95.01 Discuss Basic STP Operations and STP Processes.
95.02 Compare and contrast VLANs and STP.
95.03 Show how STP is used in the Campus Network.
95.04 Demonstrate the resolution of Redundant Links

96.0 Demonstrate proficiency routing between VLANS – The student will be able to:

96.01 Understand and discuss VLAN issues.
96.02 Route switch modules.
96.03 Show proficiency using external routers in a lab setting.

97.0 Demonstrate proficiency with multilayer switching – The student will be able to:

97.01 Define and explain MLS Processes.
97.02 Create basic MLS configurations.
97.03 Show proficiency using flow masks.
97.04 Show how to use MLS on the switch.

98.0 Demonstrate the use of hot standby routing protocol (HSRP) - The student will be able to:

98.01 Define and explain HSRP operations.
98.02 Create HSRP configurations in a lab setting.

99.0 Understand and use IGMP and multicasting – The student will be able to:

99.01 Define and explain multicasting.
99.02 Understand and discuss IGMP.
99.03 Show proficiency routing multicast traffic.
99.04 Demonstrate proficiency using multicast routing protocols.
99.05 Configure IP multicast routing in a lab setting.
99.06 List and describe optional IP multicast routing tasks.

100.0 Demonstrate proficiency restricting network access - The student will be able to:

100.01 Show proficiency creating networking policies.
100.02 Discuss and explain basic network security techniques.
100.03 Demonstrate execution of policy configurations on a set of routers.

101.0 Demonstrate proficiency using network troubleshooting tools and basic network management diagnostic tools – The student will be able to:

101.01 Explain and discuss troubleshooting methodologies and general problem-solving concepts.
101.02 List and define general considerations in troubleshooting.
101.03 Define and explain each component of the general problem-solving model.
101.04 Demonstrate proficiency using common management and diagnostic tools.
101.05 Show proficiency using network management software.
101.06 Demonstrate proficiency using router diagnostic commands.
101.07 Familiarize logging and error message formats.
101.08 Demonstrate proficiency interacting with technical support.

102.0 List and define the commonly used protocols, routing techniques, and switching processes – The student will be able to:

102.01 List and define network services, layer 2 LAN protocols, and layer 2 WAN protocols.
102.02 Race packets through a router.
102.03 Define and explain packet switching paths.
102.04 Identify performance issues affecting packet switching.
102.05 Define and explain low-level troubleshooting.

103.0 Demonstrate proficiency troubleshooting TCP/IP, LAN switch environment, VLANS, frame relay, and ISDN – The student will able to:

103.01 List, define, and explain theory, concepts, and terminology of TCP/IP, LAN switch environment, spanning tree, VLANs, frame relay, and ISDN.
103.02 List, define, and explain common problems with TCP/IP, LAN switching, and ISDN.
103.03 List, define, and explain common scenarios with VLANs, frame relay, and ISDN.
103.04 Troubleshoot TCP/IP in a Windows environment; use LAN switch troubleshooting tools, explain general VLAN troubleshooting issues; list and explain the steps in frame relay troubleshooting and ISDN problem isolation.
103.05 Use show commands to verify LAN switch configuration settings.

103.06 Use show and debug commands for TCP/IP, router VLANs, frame relay, and ISDN.
103.07 Use TCP/IP diagnostic tools.

104.0 Demonstrate proficiency configuring and trouble shooting IPX and APPLETALK – The student will be able to:

104.01 List, define, and explain theory, concepts, and terminology of IPX and AppleTalk.
104.02 Demonstrate proficiency configuring IPX and AppleTalk.
104.03 Demonstrate proficiency trouble shooting IPX and Apple Talk.
104.04 Demonstrate proficiency using show and debug command with IPX and AppleTalk.

105.0 Demonstrate proficiency troubleshooting EIGRP, OSPF, and BGP – The student will be able to:

105.01 List, define, and explain theory, concepts, and terminology of EIGRP, OSPF, and BGP.
105.02 Demonstrate proficiency configuring AAA, EIGRP, OSPF, and BGP.
105.03 Demonstrate proficiency trouble shooting EIGRP, OSPF, and BGP.
105.04 Demonstrate proficiency using the show and debug commands for OSPF and BGP.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Networking 5**
Course Number: **8207060**
Course Credit: **1**

Course Description:

This course continues the study of network support services. The content includes wireless networking technologies, implementation, management and security.

106.0 Participate in work-based learning experiences – The student will be able to:

106.01 Participate in work-based learning experiences in a network support services environment.
106.02 Discuss the use of technology in a network support services environment.
106.03 Discuss the management/supervisory skills needed in a network support service environment.

107.0 Demonstrate proficiency in applying radio frequency (RF) technologies - The student will be able to:

107.01 Define and apply the basic concepts of RF behavior.
107.02 Understand the applications of basic RF antenna concepts.
107.03 Understand and apply the basic components of RF
107.04 Identify some of the different uses for spread spectrum technologies.
107.05 Comprehend the differences between, and apply the different types of spread spectrum technologies.
107.06 Identify and apply the concepts which make up the functionality of spread spectrum technology.
107.07 Identify the laws set forth by the FCC that govern spread spectrum technology, including power outputs, frequencies, bandwidths, hop times, and dwell times.

108.0 Develop an awareness of wireless LAN technologies - The student will be able to:

108.01 Identify and apply the processes involved in authentication and association.
108.02 Recognize the concepts associated with wireless LAN service sets.
108.03 Understand the implications of the following power management features of wireless LANs.
108.04 Specify the modes of operation involved in the movement of data traffic across wireless LANs.

109.0 Perform implementation and management activities - The student will be able to:

109.01 Identify the technology roles for which wireless LAN technology is an appropriate technology application.
109.02 Identify the purpose of infrastructure devices and explain how to install, configure, and manage them.

109.03 Identify the purpose of wireless LAN client devices and explain how to install, configure, and manage them.
109.04 Identify the purpose of wireless LAN gateway devices and explain how to install, configure, and manage them.
109.05 Identify the basic attributes, purpose, and function of types of antennas.
109.06 Describe the proper locations and methods for installing antennas.
109.07 Explain the concepts of polarization, gain, beamwidth, and free-space path loss as they apply to implementing solutions that require antennas.
109.08 Identify the use of wireless LAN accessories and explain how to install, configure, and manage them.
109.09 Identify, understand, correct or compensate for wireless LAN implementation challenges.
109.10 Explain how antenna diversity compensates for multipath.
109.11 Identify and understand the importance and process of conducting a thorough site survey.
109.12 Identify and understand the importance of the necessary tasks involved in preparing to do an RF site survey.
109.13 Identify the necessary equipment involved in performing a site survey.
109.14 Understand the necessary procedures involved in performing a site survey.
109.15 Identify and understand site survey reporting procedures**.**

110.0 Develop an awareness of wireless security systems - The student will be able to:

110.01 Identify the strengths, weaknesses and appropriate uses of wireless LAN security techniques.
110.02 Describe types of wireless LAN security attacks, and explain how to identify and prevent them.
110.03 Given a wireless LAN scenario, identify the appropriate security solution from the following available wireless LAN security solutions.
110.04 Explain the uses of corporate security policies and how they are used to secure a wireless LAN.
110.05 Identify how and security precautions are used to secure a wireless LAN.

111.0 Demonstrate knowledge of wireless industry standards - The student will be able to:

111.01 Identify, apply and comprehend the differences between wireless LAN standards.
111.02 Understand the roles of organizations in providing direction and accountability within the wireless LAN industry.
111.03 Identify the differences between the ISM and UNII bands.
111.04 Identify and understand the differences between the power output rules for point-to-point and point-to-multipoint links.
111.05 Identify the basic characteristics of infrared wireless LANs.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Networking 6**
Course Number: **8207070**
Course Credit: **1**

Course Description:

This course continues the study of network support services. The content includes network security.

112.0 Participate in work-based learning experiences – The student will be able to:

- 112.01 Participate in work-based learning experiences in a network support services environment.
- 112.02 Discuss the use of technology in a network support services environment.
- 112.03 Discuss the management/supervisors skills needed in a network support services environment.

113.0 Demonstrate a knowledge of general security concepts - The student will be able to:

- 113.01 Describe access control.
- 113.02 Describe network authentication.
- 113.03 Understand the various types of network attacks (backdoors, DOS, spoofing, etc.)
- 113.04 Identify and modify non-essential services and protocols.
- 113.05 Identify malicious code (virus, worm, Trojan).
- 113.06 Configure system auditing, logging, and scanning as it relates to security procedures.

114.0 Develop an awareness of communication security concepts - The student will be able to:

- 114.01 Describe remote access protocols (VPN, RADIUS, L2TP, etc.).
- 114.02 Identify E-mail security concerns (hoaxes, spam, etc.).
- 114.03 Identify web (HTML) security concepts and designs (HTTP/S, IM, etc.).
- 114.04 Demonstrate an awareness of file transfer security concerns.
- 114.05 Describe and identify wireless networking security concerns and vulnerabilities.

115.0 Develop an awareness of network infrastructure security - The student will be able to:

- 115.01 Install and configure network firewalls.
- 115.02 Identify security concerns with various wiring media (copper, fiber).
- 115.03 Identify security concerns associated with removable media and storage devices.
- 115.04 Demonstrate an awareness of security topologies (security zones, Intranets, NAT, etc.).
- 115.05 Configure and use intrusion detection software.
- 115.06 Establish security baselines (updates, patches, hot fixes, Access Control lists, etc.).
- 115.07 Demonstrate the ability to configure a Virtual Private Network (VPN).

115.08 Describe the function of Network Address Translation (NAT**).**

116.0 Develop an awareness of cryptography and its relation to security - The student will be able to:

116.01 Demonstrate an understanding of security algorithms and encryption.
116.02 Use and apply Public Key Certificates.
116.03 Demonstrate an understanding of standards and protocols in commerce.

117.0 Incorporate organizational and operational security in an appropriate and effective manner - The student will be able to:

117.01 Describe how to establish a network security policy.
117.02 Explain the importance of physical security to protect network resources.
117.03 Identify and use disaster recovery procedures.
117.04 Describe the importance of business continuity and its relationship to network and corporate security.
117.05 Describe security policies and procedures that would be used in a business environment.
117.06 Explain the importance of privilege management (access, password management, sign-on, etc.).
117.07 Describe the concept of forensics as it applies to network security (obtaining evidence of security breaches).
117.08 Explain the importance of educating users and supervisors in regard to network security.
117.09 Create documentation that describes standards and guidelines for a network security system.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Game/Simulation/Animation Visual Design**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	8208100	B082100
CIP Number	0507.039914	0507.039914
Grade Level	9-12, 30, 31	30, 31
Standard Length	4 credits	600 hours
Teacher Certification	BUS ED 1 @2 COMPU SCI 6 COMM ART @7 G TV PRO TEC @7 G	BUS ED 1 @2 COMPU SCI 6 COMM ART @7 G TV PRO TEC @7 G
CTSO	FBLA BPA	Phi Beta Lambda BPA
SOC Codes (all applicable)	15-1099.13; 27-1014	15-1099.13; 27-1014
Facility Code	212 http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	Mathematics: 10.0 Language: 10.0 Reading: 10.0

Purpose

This program offers a sequence of project-based courses that provide coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster such as Game or Simulation Designer, Game or Simulation Graphic Artist, and Game or Simulation 3-D Animator; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to practical experiences in game/simulation conceptualization, design, storyboarding, development methodologies, 2D/3D animation design and production, and implementation issues. Specialized skills involving graphic animation software are used to produce a variety of two and three dimensional components.

Program Structure

This program is a planned sequence of instruction consisting of three occupational completion points. Students enrolling in this program must be computer literate. This literacy can be achieved by completing one credit of the Business Technology Education core. This includes Computing for College & Careers (8209020) or Introduction to Information Technology (8207310). It is also recommended that students complete academic courses in visual arts, computer arts, or digital arts. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or exit as an occupational completer.

When offered at the post secondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	DIG0070	Game/Simulation Designer	300	15-1099.13
B	DIG0071	Game/Simulation Graphic Artist	150	27-1014
C	DIG0072	Game/Simulation 3D Animator	150	27-1014

** Note: OTA0040 is a highly recommended core program.*

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8208110 8208120	Game & Simulation Foundations Game & Simulation Design	1 credit 1 credit	15-1099.13	2
B	8208130	Game & Simulation 2D Graphic Development	1 credit	27-1014	2
C	8208140	Game & Simulation 3D Graphic Animation	1 credit	27-1014	2

** Note: It is highly recommended that students complete the BTE Core, either Computing for College and Careers (8209020) or Introduction to Information Technology (8207310), prior to or concurrently with the first two courses.*

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these

occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Program Recommendations

The Game, Simulation & Animation Visual Design program lends itself to integration of the core academic subjects of language arts, math, science, visual arts, and social studies into project activities. It is through a balanced and integrated curriculum that students attain the attitudes, skills, and knowledge needed to compete successfully in today's work force. To achieve total curriculum integration, academic and career and technical education teachers should be scheduled with common planning times.

This program emphasizes the development of technical abilities as well as ethical and societal awareness necessary to function in a highly technological society. The use of cooperative learning groups is recommended. By learning and practicing group process skills, students will be prepared to work "together" in real work situations. Program graduates will develop enhanced self-esteem as well as the problem solving and teamwork skills necessary to succeed in careers and postsecondary education.

The Game, Simulation & Animation Visual Design program places a strong emphasis on workplace learning. Job shadowing and mentoring experiences with game and simulation professionals along with on-site trips to local businesses connect classroom learning to the workplace. In-class guest speakers bring the real world into the classroom.

The Foundations and Design courses should be taken in sequence prior to the 2D Graphic Development and 3D Graphic Animation courses. The 2D Graphic Development and 3D Graphic Animation courses may be taken concurrently. The BTE core course may be taken concurrently with either the Foundations course or the Design course.

The Game/Simulation/Animation Advanced Applications program (8208400) is an appropriate follow-on capstone program.

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills for secondary students. For postsecondary students, Phi Beta Lambda and BPA are the appropriate student organizations. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 10.0, Language 10.0, and Reading 10.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

The PSAV component of this program has no statewide articulation agreement approved by the Articulation Coordinating Committee. However, this does not preclude the awarding of credits by any college through local agreements.

For details on statewide articulation agreements which correlate to programs and industry certifications, refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Create a game design production plan that describes the game play, outcomes, controls, interface and artistic style of a video game.
02.0 Design and create a playable game.
03.0 Categorize the different gaming genres.
04.0 Categorize different gaming systems.
05.0 Understand the historical significance of electronic and non-electronic games.
06.0 Describe the trends in current and next-generation game development.
07.0 Understand the role of play in human culture.

08.0 Understand the psychological impact of games on individuals and groups.
09.0 Understand the business model commonly used in the game development industry.
10.0 Examine and categorize the significant processes in the production of interactive games.
11.0 Understand the core tasks and challenges that face a video game design team.
12.0 Understand legal issues that affect games, developers and players.
13.0 Describe the impact of the video game industry on the economy.
14.0 Demonstrate the professional level of written and oral communication required in the game development industry.
15.0 Demonstrate human relations/interpersonal skills for the workplace.
16.0 Investigate career opportunities in the game industry.
17.0 Demonstrate an understanding of the vocabulary for discussing games and play.
18.0 Demonstrate an understanding of the techniques used to evaluate game mechanics, game play, flow, and game design.
19.0 Describe the complex interaction between video games and players and the role it plays in the popularity of a game.
20.0 Understand the general procedure and requirements of game design.
21.0 Explore the methods used to create and sustain player immersion.
22.0 Become familiar with popular game tools such as DirectX, 3DMax, and different gaming engines.
23.0 Demonstrate an understanding of interface design and hardware constraints on video games including processors and I/O devices.
24.0 Create a working game or simulation individually or as part of a team.
25.0 Describe the game development life cycle.
26.0 Identify hardware constraints on video games including processors and I/O devices.
27.0 Identify non-hardware development constraints.
28.0 Understand the general principles of storytelling.
29.0 Understand the use of storyboarding in game design.
30.0 Develop a game design document or blueprint.
31.0 Understand strategic outlining in game designs.
32.0 Explore elements of puzzle design.
33.0 Discuss key strategic considerations in game design.
34.0 Understand the process of creating and designing player actions.
35.0 Create and design the game flow as it relates to story and plot.
36.0 Assess common principles and procedures in game flow design.
37.0 Describe rule creation elements of player challenge.
38.0 Identify tools and software commonly used in game development.
39.0 Understand the methodologies for integrating digital media into a game or simulation.
40.0 Identify commonly used art and animation production tools in the game design industry.
41.0 Understand the general concepts of environmental design.
42.0 Describe how environmental design is used in conjunction with game level design.
43.0 Define the meaning of simulation and pertinent issues facing game designers.
44.0 Describe applied event modeling as it relates to game design.
45.0 Understand basic HCI principles.
46.0 Discuss the eight golden rules of HCI.
47.0 Understand the use of inventory systems in game design.

48.0 Understand the significance of historical and cultural heritage of art and artistic styles as it relates to 2D game graphics.
49.0 Understand intellectual property rights, copyright laws and plagiarism as it applies to creative assets.

50.0 Understand the various job titles and responsibilities of a 2D artist as it relates to the game industry.
51.0 Develop the art direction for a 2D game.
52.0 Determine and document the graphical and animation needs of a game using design documents including art direction and reference materials.
53.0 Understand the fundamentals of drawing and painting techniques.
54.0 Demonstrate a working knowledge of vector and paint programs used to make 2D graphics and animation.
55.0 2D world building, making graphics and backgrounds for 2D side scrolling, top down, and Isometric projection.
56.0 Understand the principles of Sprite animation as it relates to 2D game graphics (walk, run, Jump, idle…etc.).
57.0 Facial animation, expressions, and audio lip syncing.
58.0 Create graphics for the user interface including titles and button states.
59.0 Particle system design and other in-game effects such as lighting and shadows.
60.0 Demonstrate the effective use of 2D hardware such as scanners and digital tablets.
61.0 Understand the significance of historical and cultural heritage of art and artistic styles as it relates to 3D game graphics.
62.0 Understand intellectual property rights, copyright laws and plagiarism as it applies to creative assets.
63.0 Understand the various job titles and responsibilities of a 3D artist as it relates to the game industry.
64.0 Develop the art direction for a 3D game.
65.0 Determine and document the graphical and animation needs of a game using design documents including art direction and reference materials.
66.0 Understand the fundamentals of drawing and painting techniques.
67.0 Demonstrate a working knowledge of modeling and paint programs used to make 3D graphics and animation.
68.0 3D world building, making graphics and backgrounds for 3D side scrolling, top down, and Isometric projection.
69.0 Understand the principles of Sprite animation as it relates to 3D game graphics (walk, run, Jump, idle…etc.).
70.0 Facial animation, expressions, and audio lip syncing.
71.0 Create graphics for the user interface including titles and button states.
72.0 Particle system design and other in-game effects such as lighting and shadows.
73.0 Demonstrate the effective use of 3D hardware such as scanners and digital tablets.
74.0 Demonstrate language arts knowledge and skills.
75.0 Demonstrate mathematics knowledge and skills.
76.0 Demonstrate science knowledge and skills.
77.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
78.0 Solve problems using critical thinking skills, creativity and innovation.
79.0 Use information technology tools.
80.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
81.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
82.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
83.0 Describe the importance of professional ethics and legal responsibilities.

84.0 Explain the importance of employability skill and entrepreneurship skills.
85.0 Demonstrate personal money-management concepts, procedures, and strategies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Game, Simulation, Animation Programming**
PSAV Number: **B082100**

Course Number: DIG0070
Occupational Completion Point – A
Game/Simulation Designer – 300 Hours – SOC Code 15-1099.13

Game & Simulation Creation

Instruction relating to the standards in this section should be interspersed throughout the entire course with the other standards taught progressively in the context of game design and development.

01.0 Create a game design production plan that describes the game play, outcomes, controls, interface and artistic style of a video game. – The student will be able to:

- 01.01 Use industry standard game design production documents to create a game design production plan.

02.0 Design and create a playable game. – The student will be able to:

- 02.01 Use a number of computer tools to enhance and ease game programming and artistry.
- 02.02 Use a game engine to create a playable game.
- 02.03 Use animated objects.
- 02.04 Program sound and music to enhance the game experience.
- 02.05 Test and debug the completed game.

Critical Game & Simulation Studies

03.0 Categorize the different gaming genres. – The student will be able to:

- 03.01 Research, compare and categorize the different gaming genres.
- 03.02 Analyze examples of different gaming genres.
- 03.03 Define and use the necessary vocabulary related to gaming and the different genres.

04.0 Categorize different gaming systems. – The student will be able to:

- 04.01 Research, compare and categorize different gaming systems.
- 04.02 Analyze the distinctive features of each system.
- 04.03 Define the target audience for different systems based on features, available games, and price of system and games.
- 04.04 Define and use the necessary vocabulary related to gaming hardware.

05.0 Understand the historical significance of electronic and non-electronic games. – The student will be able to:

- 05.01 Discuss the history of non-electronic games.
- 05.02 Describe the history and theory of mainstream and experimental media including radio, movies, television, art, and theatre.
- 05.03 Explain the historical timeline of electronic games, marking the significant highlights in their evolution.

06.0 Describe the trends in current and next-generation game development. – The student will be able to:

- 06.01 Determine and analyze the significant trends in game development in the past two decades.
- 06.02 Research and brainstorm the possibilities for the next generation of electronic games based on current and emerging technologies and future predictions.

Societal Impact

07.0 Understand the role of play in human culture. – The student will be able to:

- 07.01 Discuss the word “play” and its many definitions.
- 07.02 Discuss the effect of play on today’s culture, specifically why it is important and what it provides in terms of balance in our lives.
- 07.03 Describe the history of play and its importance in developing societies and cultures.
- 07.04 Investigate and discuss how play can help humans, particularly children, acquire knowledge.
- 07.05 Describe the benefits of role-playing games and simulations, including online economies and community-building.

08.0 Understand the psychological impact of games on individuals and groups. – The student will be able to:

- 08.01 Investigate studies that discuss the impact of violent games on children and adults.
- 08.02 Compare and contrast the different opinions on the effects of games on behavior, cognitive development, and motor skills.
- 08.03 Research and discuss differing opinions on video game addiction and what would define addiction.
- 08.04 Examine online digital worlds such as Second Life and the impact these worlds have on individuals and groups.

Management & Industry

09.0 Understand the business model commonly used in the game development industry. – The student will be able to:

- 09.01 Identify, define and discuss the different ways games are funded, marketed and sold.
- 09.02 Identify and describe licensing management for different gaming platforms.

09.03 Discuss the product value and business differences between major game platforms.
09.04 Identify successful business models and analyze various facets of those models, such as market analysis, marketing strategy, and product value.

10.0 Examine and categorize the significant processes in the production of interactive games. – The student will be able to:

10.01 Discuss the relationships between publishers, developers, distributors, marketers, and retailers.
10.02 Identify processes of development including content creation, team roles, design documentation, and process management.
10.03 Explore and describe the effects of globalization on the design and production of video games.

11.0 Understand the core tasks and challenges that face a video game design team. – The student will be able to:

11.01 Identify and define the roles and responsibilities of team members on a video game design team.
11.02 Describe the effects of group dynamics and the importance of team building for a design team.
11.03 Explore and discuss methods of communications and scheduling for design teams.
11.04 Describe the importance and interrelationship between development schedule and budget constraints in video game design.

12.0 Understand legal issues that affect games, developers and players. – The student will be able to:

12.01 Define and discuss intellectual property and contract law as it relates to the gaming industry.
12.02 Describe legal and liability issues that could affect online communities.
12.03 Compare and contrast government and industry content regulation and industry ratings of video games.

13.0 Describe the impact of the video game industry on the economy. – The student will be able to:

13.01 Explore and discuss the impact of video games on the economy including domestic sales, foreign exports, and video game rentals.
13.02 Research and describe the effect of game software in driving new technologies and the purchases of video game hardware, gaming PCs, and complementary technologies such as high-definition televisions.
13.03 Analyze the technological transfers from video games to other industries, such as education, medical, corporate training, and military simulation technologies that were developed by the video game industry, as well as 3D "gaming" graphics cards that have found use for other applications.
13.04 Describe how frequent exposure and/or access to video games has reshaped the level of technical proficiency of our work force.

Job Readiness & Career Development

14.0 Demonstrate the professional level of written and oral communication required in the game development industry. – The student will be able to:

- 14.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 14.02 Organize ideas and communicate oral and written messages appropriate for the game development industry environment
- 14.03 Identify, define, and discuss terminology appropriate for both internal and external communications in the game development industry environment.

15.0 Demonstrate human relations/interpersonal skills for the workplace. – The student will be able to:

- 15.01 Solicit and accept constructive criticism.
- 15.02 Demonstrate personal and interpersonal skills appropriate for the workplace such as responsibility, dependability, punctuality, positive attitude, initiative, respect for self and others, and professional dress.
- 15.03 Collaborate with individuals and teams to complete tasks and solve problems.

16.0 Investigate career opportunities in the game industry. – The student will be able to:

- 16.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 16.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.
- 16.03 Describe job requirements for a variety of occupations within the game development industry.

Game & Simulation Analysis

17.0 Demonstrate an understanding of the vocabulary for discussing games and play. – The student will be able to:

- 17.01 Identify, define, and discuss professional game design and analysis terminology appropriate for internal and external communications in a game design environment.
- 17.02 Identify and define the vocabulary used by game players and online gaming communities.

18.0 Demonstrate an understanding of the techniques used to evaluate game mechanics, game play, flow and game design. – The student will be able to:

- 18.01 Test and analyze games to determine the quality of rules, interfaces, navigation, performance, play, artistry and longevity in design and structure.
- 18.02 Research and evaluate the game analysis techniques used by the video game industry.
- 18.03 Identify the key elements in a game and make intelligent judgments about whether the game succeeded or failed in its objectives.

18.04 Evaluate professional reviews and write a critical analysis of a current video game.

19.0 Describe the complex interaction between video games and players and the role it plays in the popularity of a game. – The student will be able to:

19.01 Analyze and deconstruct game environments and interactions.
19.02 Compare and contrast the top selling video games in terms of player interaction, plot complexity, and reward.

Game & Simulation Design

20.0 Understand the general procedure and requirements of game design. – The student will be able to:

20.01 Describe the design process from conception to production.
20.02 Discuss the iterative nature of game and simulation design.
20.03 Develop design plans, character sketches, documentation and storyboards for proposed games.

21.0 Explore the methods used to create and sustain player immersion. – The student will be able to:

21.01 Research and define the term “player immersion”.
21.02 Explore and explain the factors that create player immersion in a game.
21.03 Examine popular games and explain the methods each game uses to increase player immersion.

22.0 Become familiar with popular game tools such as DirectX, 3DMAX, and different gaming engines. – The student will be able to:

22.01 Identify and discuss the popular game development tools currently used in the industry.
22.02 Identify and discuss popular gaming engines.
22.03 Research and analyze the uses for different game development tools.

23.0 Demonstrate an understanding of interface design and hardware constraints on video games including processors and I/O devices. – The student will be able to:

23.01 Identify the different control systems for video games.
23.02 Compare and contrast personal computer and video game console hardware.
23.03 Explain the factors that can limit the game playing ability of personal computers.
23.04 Chart the evolution of video game hardware over the past 20 years.

Game/Simulation Project

Instruction relating to the standards in this section should be interspersed throughout the entire course with the other standards taught progressively in the context of game design and development.

24.0 Create a working game or simulation individually or as part of a team. – The student will be able to:

- 24.01 Create a storyboard describing the essential elements, plot, flow, and functions of the game/simulation.
- 24.02 Create a design specification document to include interface and delivery choices, rules of play, navigation functionality, scoring, media choices, start and end of play, special features, and development team credits.
- 24.03 Using a simple game development tool, create a game or simulation.
- 24.04 Present the game or simulation.

Design Essentials

25.0 Describe the game development life cycle. – The student will be able to:

- 25.01 Identify steps in the pre-production process including the proof of concept and market research.
- 25.02 Describe the iterative prototyping process – Alpha, Beta, RTM.
- 25.03 Determine scripting requirements.
- 25.04 Implement techniques of scenario development, levels, and missions.
- 25.05 Discuss game testing requirements and methods.
- 25.06 Identify and describe maintenance, upgrade and sequel issues.

26.0 Identify hardware constraints on video games including processors and I/O devices. – The student will be able to:

- 26.01 Identify the different control systems for video games.
- 26.02 Compare and contrast personal computer and video game console hardware, including display systems.
- 26.03 Explain the factors that can limit the game-playing ability of personal computers.

27.0 Identify non-hardware development constraints. – The student will be able to:

- 27.01 Identify and discuss software integration issues relating to scripting, sound, art animation, game engine and world design software integration.
- 27.02 Describe constraints such as development time, personnel, talent acquisition, financial/budget constraints, and schedule.
- 27.03 Describe societal and legal constraints affecting game and simulation design.

Game Design Documentation

28.0 Understand the general principles of storytelling. – The student will be able to:

- 28.01 Identify the essential elements of a story.
- 28.02 Describe how creative writing is used as a game design tool.
- 28.03 Compare and contrast methods of delivering a story in a game.

29.0 Understand the use of storyboarding in game design. – The student will be able to:

- 29.01 Assess the techniques used in the gaming industry for rendering basic Game Design Art.

29.02 Describe how game layout charts are used in game design.
29.03 Describe how storyboards in the game design process can be used as a pre-development sales tool.
29.04 Analyze and compare the use of storyboards in the game design industry with regard to environmental illustrations, level designs, character designs, model sheets and GUI Designs.

30.0 Develop a game design document or blueprint. – The student will be able to:

30.01 Evaluate and discuss the choice of delivery system.
30.02 Evaluate and discuss choices of genre, game design software, art, digital media, and animation software.
30.03 Create a game strategy overview, character overview, and storyboard overview.
30.04 Define the rules of play and multi-player options.
30.05 Create the layout and interfaces overview and digital media overview.
30.06 Determine the event modeling requirements and create the progression levels overview.
30.07 Define strategic positioning of game immersion dynamics and psychological effect.
30.08 Identify hardware and software constraints.

Game Strategy

31.0 Understand strategic outlining in game designs. – The student will be able to:

31.01 Assess techniques of goal design in gaming.
31.02 Describe the concept of nested victories.
31.03 Discuss the use of players as agents of change.
31.04 Compare and contrast examples of understandable context in gaming.
31.05 Discuss the principles underlying the creation of understandable rules.
31.06 Describe how skill building is used in game design.
31.07 Describe conventional techniques of positive feedback.
31.08 Discuss functional consistency as it relates to the use of interfaces.

32.0 Explore elements of puzzle design. – The student will be able to:

32.01 Describe the essential elements of a puzzle.
32.02 Identify the different types of puzzles.
32.03 Describe the basic principles of high-level puzzle design.
32.04 Describe the basic principles of low-level puzzle design.

33.0 Discuss key strategic considerations in game design. – The student will be able to:
33.01 Describe the use of artificial intelligence challenges in game design and the need for giving the player rest time between challenges.
33.02 Evaluate the impact of randomness in game design especially as it pertains to pattern recognition.
33.03 Identify techniques used in the industry to help the player to navigate.
33.04 Explain the use of “just barely” victories as an exciting and immersive technique.
33.05 Assess techniques used to provide a range of challenges and appeal to a wide range of abilities.

33.06 Describe the psychological cost of failure in games as it pertains to immersion and psychological effect.
33.07 Identify methods of preparing the player for greater challenge while allowing for plot development as the story serves the game.

Rules of Play

34.0 Understand the process of creating and designing player actions. – The student will be able to:

34.01 Discuss the principles of player-centric design.
34.02 Research and correlate game complexity level to appropriate age group such that content matches user skill set required.
34.03 Examine and discuss design elements that encourage continuous active engagement both mental and physical.
34.04 Analyze design elements that maintain player interest and vary the degree of challenge.
34.05 Discuss the need for a balance of design elements for the purpose of rewarding and frustrating players.

35.0 Create and design the game flow as it relates to story and plot. – The student will be able to:

35.01 Identify techniques of introducing the story plot and beginning play.
35.02 Describe story plot development techniques for the middle of play in game design.
35.03 Analyze and discuss planning techniques for climax and finale of games.

36.0 Assess common principles and procedures in game flow design. – The student will be able to:

36.01 Assess missions and scenarios game flow techniques.
36.02 Describe common use of mission design and campaigns.
36.03 Evaluate usage of static versus dynamic campaigns.

37.0 Describe rule creation elements of player challenge. – The student will be able to:

37.01 Research common design methods for clearing obstacles or series of obstacles.
37.02 Describe common design elements introducing skill, luck and combinations including escalating challenges to games.
37.03 Identify common design elements used to vary weapons, characters and tools.
37.04 Discuss the incorporation of risk reward and adaptive challenges (AI).
37.05 Evaluate industry use of boss encounters in games.
37.06 Analyze and discuss design considerations from the perspective of other players and multi-player environments.

Game Development Tools

38.0 Identify tools and software commonly used in game development. – The student will be able to:

38.01 Identify and discuss the popular game development tools currently used in the industry.
38.02 Identify and discuss popular gaming engines.
38.03 Identify and discuss popular world building tools.

Music, Sound, Art & Animation

39.0 Understand the methodologies for integrating digital media into a game or simulation. – The student will be able to:

39.01 Survey and discuss the use of naming conventions and temp sounds.
39.02 Analyze and discuss methods of matching sound effects to art assets.
39.03 Identify and categorize commonly used technology sound engine integration equipment.
39.04 Identify and discuss resources such as sound effects libraries.
39.05 Examine methods of sound implementation and associated software.
39.06 Describe how and why digital video may be integrated into a game or simulation design.
39.07 Describe how special effects differ from animation.

40.0 Identify commonly used art and animation production tools in the game design industry. – The student will be able to:

40.01 Identify, categorize and discuss art and animation tools commonly used in game design.

Environmental Design

41.0 Understand the general concepts of environmental design. – The student will be able to:

41.01 Survey and evaluate commonly used concept art.
41.02 Create a world sketch with particular attention to maintaining continuity of style.
41.03 Describe the emotional/psychological aspects of environmental design that signify mood, façade of freedom, and resource struggling.

42.0 Describe how environmental design is used in conjunction with game level design. – The student will be able to:

42.01 Examine and evaluate examples of focus on a theme.
42.02 Describe methods of creating a purposeful architecture giving consideration to continuity and themes and taking advantage of revisiting.
42.03 Consider and discuss environmental design elements for multi-player or single player games.
42.04 Describe the history of creating shifts in game design environments and embracing novel ideas.
42.05 Identify and discuss environmental design pitfalls such as red herrings and cookie-cutter layouts.

Event Modeling in Game Design

43.0 Define the meaning of simulation and pertinent issues facing game designers. – The student will be able to:

43.01 Discuss the meaning of simulation and give examples of simulation and complexity including architecture, exposure, concealment and heuristics.
43.02 Describe applied event modeling including goal discovery, map making, event exploration, developing incentives and learning in event modeling for games.
43.03 Explain the concepts of modes of understanding, inductive and iconic logic, significance and saturation in event modeling for game design.

44.0 Describe applied event modeling as it relates to game design. – The student will be able to:

44.01 Discuss the process of specifying events including contexts of simulation, translating event models to simulations, formalizing thematic objectives, prototyping, interface design and use cases with modeling.
44.02 Describe the design of an application framework including extensible frameworks, software design, configuration, encapsulation, windows and message loops.
44.03 Describe the implementation of an application framework including adding graphics, GUI events and controls, and creating a console.
44.04 Discuss the process of designing entities including behavior and entity graphics.
44.05 Describe the implementation of entities including enumerating animations, playing with time, creating events, adding an entity class, and creating entity events and behaviors.
44.06 Analyze event modeling in creating a world including the creation of a world class, adding and removing entities, accessing entities, updating and rendering, adding scene hierarchies and handling world events.
44.07 Assess and discuss AI and physics issues for simulation including AI event contexts, adding intelligence and gravity, adding collision detection, updating for collisions and applying mass and force.
44.08 Discuss environmental elements of simulation including logic, cognitive saturation, systems and interpretation, context of reality, shadows and lighting.
44.09 Discuss the simulation of physical systems such as trees and forests and related events such as fires, or insect swarms such as beehives, bird flocks or anthills.
44.10 Describe the simulation of social and economic systems including practical applications, historical precedents, modeling for community events, creation of communities including structures, states events and rendering and altering building states, population behaviors, and controlling influences.
44.11 Describe the process of testing simulations and event models including effectiveness, diagrammatic systems evaluation, context influence, path transitions and assessing messages.

Interface Design

45.0 Understand basic HCI principles. – The student will be able to:

45.01 Define and give examples of how HCI principles are considered in designing a game or simulation.

45.02 Describe how client user background, education, goals, motivation, training, culture, age, gender, physical abilities and client sophistication affect interface design.

46.0 Discuss the eight golden rules of HCI. – The student will be able to:

46.01 Discuss the need for functional consistency, shortcuts, feedback, closure, error prevention, easy reversal of actions, feeling in control, and avoiding memory overload.
46.02 Identify game design enhancements that could make better use of HCI Principles.

47.0 Understand the use of inventory systems in game design. – The student will be able to:

47.01 Discuss the various methods of describing items in player's inventory in contemporary game design.
47.02 Review and discuss industry methods of communicating how inventory items can have an effect on game play.

74.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

74.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
74.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
74.03 Present information formally and informally for specific purposes and audiences. AF2.9

75.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

75.01 Demonstrate knowledge of arithmetic operations. AF3.2
75.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
75.03 Construct charts/tables/graphs using functions and data. AF3.5

76.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

76.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
76.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

77.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

77.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
77.02 Locate, organize and reference written information from various sources. CM 3.0
77.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
77.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
77.05 Apply active listening skills to obtain and clarify information. CM 7.0

77.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
77.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

78.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

78.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
78.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
78.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
78.04 Conduct technical research to gather information necessary for decision-making. PS 4.0

79.0 Use information technology tools. – The student will be able to:

79.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
79.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
79.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
79.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

80.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

80.01 Describe the nature and types of business organizations. SY 1.0
80.02 Explain the effect of key organizational systems on performance and quality.
80.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
80.04 Explain the impact of the global economy on business organizations.

83.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

83.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
83.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
83.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
83.04 Interpret and explain written organizational policies and procedures. ELR 2.0

Course Number: DIG0071
Occupational Completion Point – B
Game/Simulation 2D Graphic Artist – 150 Hours – SOC Code 27-1014

48.0 Understand the significance of historical and cultural heritage of art and artistic styles as it relates to 2D game graphics. – The student will be able to:

- 48.01 Identify styles of art and trends such as surrealism, pop art, and expressionism by viewing reproductions, prints, videos, periodicals, books or Internet sites.
- 48.02 Identify art styles from various historical periods.
- 48.03 Use concise vocabulary to compare and contrast artistic elements and design principles in personal works and the works of others.
- 48.04 Explore the details in works noting the use of materials, lighting and features that contribute to the overall feel and mood of the work.

49.0 Understand intellectual property rights, copyright laws and plagiarism as it applies to creative assets. – The student will be able to:

- 49.01 Understand the use of “Fair use and Fair Dealing”.
- 49.02 Understand the transfer and licensing of creative works.
- 49.03 Understand the use of “exclusive rights” to intellectual creations.
- 49.04 Demonstrate the use of digital watermarking.

50.0 Understand the various job titles and responsibilities of a 2D artist as it relates to the game industry. – The student will be able to:

- 50.01 Identify the job titles of visual artist used in a 2D game project.
- 50.02 Demonstrate the ability to work as part of an art team.
- 50.03 Perform the role of the concept artist for a 2D game project.
- 50.04 Perform the role of the art director for a 2D game project.
- 50.05 Perform the role of the texture artist for a 2D game project.
- 50.06 Perform the role of the environment artist for a 2D game project.

51.0 Develop the art direction for a 2D game. – The student will be able to:

- 51.01 Develop a vision for visual elements of a 2D game.
- 51.02 Effectively convey the mood or psychological appeal of the game to the target audience through the use of visual styles.
- 51.03 Create conceptual game art using various techniques, emphasizing space and form through range of value, placement, reflections, and shadows.
- 51.04 Create character sketches, architectural sketches and background sketches for the concept artist to render from.
- 51.05 Develop the game design documents, including schedules and technical specifications for the art team.
- 51.06 Understand the challenges of art direction as it relates to mobile devices.

52.0 Determine and document the graphical and animation needs of a game using design documents including art direction and reference materials. – The student will be able to:

- 52.01 Understand the design requirements and limitations of a 2D game engine.

52.02 Develop characters and game elements in respect to the art direction laid out in the design documents
52.03 Determine the appropriate file format vector based resolution independent vs. pixel based graphics which are resolution dependent.
52.04 Understand the different aspects of quality and detail in relation to performance and size.
52.05 Understand the role of naming conventions as it applies to creative assets storage used in the work flow.
52.06 Demonstrate the effective us of alternative resolutions, scaling and file formats.

53.0 Understand the fundamentals of drawing and painting techniques. – The student will be able to:

53.01 Demonstrate the use (traditional or digital) of inks, watercolors, acrylics, oils, and mixed media in a 2D game.
53.02 Demonstrate the use of different techniques, format, media or style.
53.03 Understand the use of primitives.
53.04 Demonstrate basic understanding of composition of a scene.
53.05 Understand the shape of the human form.
53.06 Know the value of lights and shadows.

54.0 Demonstrate a working knowledge of vector and paint programs used to make 2D graphics and animation. – The student will be able to:

54.01 Know the difference between Vectors and Bitmaps.
54.02 Demonstrate understanding of various 2D art programs.
54.03 Utilize the programs tools and brushes
54.04 Know the importance of Layers.
54.05 Identify file formats

55.0 2D world building, making graphics and backgrounds for 2D side scrolling, top down, and Isometric projection. – The student will be able to:
55.01 Know the importance of scale in relation to the player.
55.02 Understand 2D level design to successfully lead the player.
55.03 Effectively use 2D graphics to convey mood and story in the game world.

56.0 Understand the principles of Sprite animation as it relates to 2D game graphics (walk, run, Jump, idle…etc.). – The student will be able to:

56.01 Demonstrate the ability to create character and object views from which to animate.
56.02 Break down animation into a series of pictures to import animation to a game engine.
56.03 Demonstrate the effective use of animation loops and cycles in a game engine.
56.04 Demonstrate an understanding of the value of timing to convey character motion
56.05 Demonstrate the effective use of animation arcs for the articulation of body elements
56.06 Demonstrate the use of principles of animation such as anticipation, squash, stretch, weight, exaggeration and overlapping & secondary motion

57.0 Facial animation, expressions, and audio lip syncing. – The student will be able to:

57.01 Know the basics of lip syncing.
57.02 Understand facial land marking
57.03 Demonstrate the ability to show emotions thru the eyes.

58.0 Create graphics for the user interface including titles and button states. – The student will be able to:

58.01 Understanding good menu flow of the user interface
58.02 Designing the ideal HUD (Heads Up Display)
58.03 Wisely using text in the game interface.
58.04 Demonstrate the ability for creating Mock-Ups.

59.0 Particle system design and other in-game effects such as lighting and shadows. – The student will be able to:

59.01 Understand particle design for fire and smoke.
59.02 Create water using 2D particles.
59.03 Know the anatomy of an explosion effect.
59.04 Create a 3D feel in a 2D world using light and shadows.

60.0 Demonstrate the effective use of 2D hardware such as scanners and digital tablets. – The student will be able to:

60.01 Demonstrate the installation, software and hardware associated with digital tablets, scanners, and a digital camera.
60.02 Demonstrate the use of a digital tablet within a paint software application.
60.03 Demonstrate the process of capturing textures using a digital camera.
60.04 Demonstrate the process of importing images from a digital camera into a photo editing software application.
60.05 Demonstrate the proper use of a scanner for image processing.

81.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

81.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
81.02 Explain emergency procedures to follow in response to workplace accidents.
81.03 Create a disaster and/or emergency response plan. SHE 2.0

82.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

82.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
82.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
82.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
82.04 Employ mentoring skills to inspire and teach others. LT 5.0

84.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

84.01	Identify and demonstrate positive work behaviors needed to be employable.	ECD 1.0
84.02	Develop personal career plan that includes goals, objectives, and strategies.	ECD 2.0
84.03	Examine licensing, certification, and industry credentialing requirements.	ECD 3.0
84.04	Maintain a career portfolio to document knowledge, skills, and experience.	ECD 5.0
84.05	Evaluate and compare employment opportunities that match career goals.	ECD 6.0
84.06	Identify and exhibit traits for retaining employment.	ECD 7.0
84.07	Identify opportunities and research requirements for career advancement.	ECD 8.0
84.08	Research the benefits of ongoing professional development.	ECD 9.0
84.09	Examine and describe entrepreneurship opportunities as a career planning option.	ECD 10.0

85.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

85.01	Identify and describe the services and legal responsibilities of financial institutions.	FL 2.0
85.02	Describe the effect of money management on personal and career goals.	FL 3.0
85.03	Develop a personal budget and financial goals.	FL3.1
85.04	Complete financial instruments for making deposits and withdrawals.	FL3.2
85.05	Maintain financial records.	FL3.3
85.06	Read and reconcile financial statements.	FL3.4
85.07	Research, compare and contrast investment opportunities.	

Course Number: DIG0072
Occupational Completion Point – C
Game/Simulation 3D Graphic Animator – 150 Hours – SOC Code 27-1014

61.0 Understand the significance of historical and cultural heritage of art and artistic styles as it relates to 3D game graphics. – The student will be able to:

61.01 Identify styles of art and trends such as surrealism, pop art, and expressionism by viewing reproductions, prints, videos, periodicals, books or Internet sites.
61.02 Identify art styles from various historical periods.
61.03 Use concise vocabulary to compare and contrast artistic elements and design principles in personal works and the works of others.
61.04 Explore the details in works noting the use of materials, lighting and features that contribute to the overall feel and mood of the work.

62.0 Understand intellectual property rights, copyright laws and plagiarism as it applies to creative assets. – The student will be able to:

62.01 Understand the use of “Fair use and Fair Dealing”.
62.02 Understand the transfer and licensing of creative works.
62.03 Understand the use of “exclusive rights” to intellectual creations.
62.04 Demonstrate the use of digital watermarking.

63.0 Understand the various job titles and responsibilities of a 3D artist as it relates to the game industry. – The student will be able to:

63.01 Identify the job titles of visual artist used in a 3D game project.
63.02 Demonstrate the ability to work as part of an art team.
63.03 Perform the role of the concept artist for a 3D game project.
63.04 Perform the role of the art director for a 3D game project.
63.05 Perform the role of the texture artist for a 3D game project.
63.06 Perform the role of the environment artist for a 3D game project.

64.0 Develop the art direction for a 3D game. – The student will be able to:

64.01 Develop a vision for visual elements of a 3D game.
64.02 Effectively convey the mood or psychological appeal of the game to the target audience through the use of visual styles.
64.03 Create conceptual game art using various techniques, emphasizing space and form through range of value, placement, reflections, and shadows.
64.04 Create character sketches, architectural sketches and background sketches for the concept artist to render from.
64.05 Develop the game design documents, including schedules and technical specifications for the art team.
64.06 Understand the challenges of art direction as it relates to mobile devices.

65.0 Determine and document the graphical and animation needs of a game using design documents including art direction and reference materials. – The student will be able to:

65.01 Understand the design requirements and limitations of a 3D game engine.
65.02 Develop characters and game elements in respect to the art direction laid out in the design documents
65.03 Determine the appropriate file format as it applies to pixel based graphics, which are resolution dependent.
65.04 Understand the different aspects of quality and detail in relation to performance and size.
65.05 Understand the role of naming conventions as it applies to creative assets storage used in the work flow.
65.06 Demonstrate the effective us of alternative resolutions, scaling and file formats.

66.0 Understand the fundamentals of drawing and painting techniques. – The student will be able to:

66.01 Demonstrate the use (traditional or digital) of inks, watercolors, acrylics, oils, and mixed media in a 3D game.
66.02 Demonstrate the use of different techniques, format, media or style.
66.03 Understand the use of primitives.
66.04 Demonstrate basic understanding of composition of a scene.
66.05 Understand the shape of the human form.
66.06 Know the value of lights and shadows.

67.0 Demonstrate a working knowledge of modeling and paint programs used to make 3D graphics and animation. – The student will be able to:

67.01 Understand the limitation of bitmaps graphics.
67.02 Understand the use and application of bump map images applied to a model.
67.03 Demonstrate understanding of various 3D art programs.
67.04 Utilize the programs tools and brushes
67.05 Know the importance of Layers.
67.06 Identify file formats

68.0 3D world building, making graphics and backgrounds for 3D side scrolling, top down, and Isometric projection. – The student will be able to:

68.01 Know the importance of scale in relation to the player.
68.02 Understand 3D level design to successfully lead the player.
68.03 Effectively use 3D graphics to convey mood and story in the game world.

69.0 Understand the principles of Sprite animation as it relates to 3D game graphics (walk, run, Jump, idle…etc.). – The student will be able to:

69.01 Demonstrate the ability to create character and object views from which to animate.
69.02 Break down animation into a series of pictures to import animation to a game engine.
69.03 Demonstrate the effective use of animation loops and cycles in a game engine.
69.04 Demonstrate an understanding of the value of timing to convey character motion.
69.05 Demonstrate the effective use of animation arcs for the articulation of body elements.
69.06 Demonstrate the use of principles of animation such as anticipation, squash, stretch, weight, exaggeration and overlapping & secondary motion.
69.07 Understand the use of motion capture techniques and acting principles.

70.0 Facial animation, expressions, and audio lip syncing. – The student will be able to:

70.01 Know the basics of lip syncing.
70.02 Understand facial land marking
70.03 Demonstrate the ability to show emotions thru the eyes.
70.04 Demonstrate the use of motion capture data as it applies to facial animation.

71.0 Create graphics for the user interface including titles and button states. – The student will be able to:

71.01 Understanding good menu flow of the user interface
71.02 Designing the ideal HUD (Heads Up Display)
71.03 Wisely using text in the game interface.
71.04 Demonstrate the ability for creating Mock-Ups.

72.0 Particle system design and other in-game effects such as lighting and shadows. – The student will be able to:

72.01 Understand particle design for fire and smoke.
72.02 Create water using 3D particles.
72.03 Know the anatomy of an explosion effect.

72.04 Create a photorealistic or artistic style in a 3D world using light, shadows, bump maps, and textures.

73.0 Demonstrate the effective use of 3D hardware such as scanners and digital tablets. – The student will be able to:

73.01 Demonstrate the installation, software and hardware associated with digital tablets, scanners, and a digital camera.
73.02 Demonstrate the use of a digital tablet within a paint software application.
73.03 Demonstrate the process of capturing textures using a digital camera.
73.04 Demonstrate the process of importing images from a digital camera into a photo editing software application.
73.05 Demonstrate the proper use of a scanner for image processing.
73.06 Understand the use of motion capture systems, optical, mechanical, mark less as it applies to 3D animation content.
73.07 Understand the use of 3D scanners to create objects and apply textures images captured from the device.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Game & Simulation Foundations**
Course Number: **8208110**
Course Credit: **1**

Course Description:

This course is designed to provide an introduction to game and simulation concepts and careers, the impact game and simulation has on society and industry, and basic game/simulation design concepts such as rule design, play mechanics, and media integration. This course compares and contrasts games and simulations, key development methodologies and tools, careers, and industry-related information. This course also covers strategies, processes, and methods for conceptualizing a game or simulation application; storyboarding techniques; and development tools.

Hands-on activities using an entry-level game development tool such as Game Maker or Alice should be integrated into the curriculum. **Regardless of topic sequencing, the culminating activity is the creation of a playable game.**

Game & Simulation Creation

Instruction relating to the standards in this section should be interspersed throughout the entire course with the other standards taught progressively in the context of game design and development.

01.0 Create a game design production plan that describes the game play, outcomes, controls, interface and artistic style of a video game. – The student will be able to:

- 01.01 Use industry standard game design production documents to create a game design production plan.

02.0 Design and create a playable game. – The student will be able to:

- 02.01 Use a number of computer tools to enhance and ease game programming and artistry.
- 02.02 Use a game engine to create a playable game.
- 02.03 Use animated objects.
- 02.04 Program sound and music to enhance the game experience.
- 02.05 Test and debug the completed game.

Critical Game & Simulation Studies

03.0 Categorize the different gaming genres. – The student will be able to:

- 03.01 Research, compare and categorize the different gaming genres.
- 03.02 Analyze examples of different gaming genres.

03.03 Define and use the necessary vocabulary related to gaming and the different genres.

04.0 Categorize different gaming systems. – The student will be able to:

04.01 Research, compare and categorize different gaming systems.
04.02 Analyze the distinctive features of each system.
04.03 Define the target audience for different systems based on features, available games, and price of system and games.
04.04 Define and use the necessary vocabulary related to gaming hardware.

05.0 Understand the historical significance of electronic and non-electronic games. – The student will be able to:

05.01 Discuss the history of non-electronic games.
05.02 Describe the history and theory of mainstream and experimental media including radio, movies, television, art, and theatre.
05.03 Explain the historical timeline of electronic games, marking the significant highlights in their evolution.

06.0 Describe the trends in current and next-generation game development. – The student will be able to:

06.01 Determine and analyze the significant trends in game development in the past two decades.
06.02 Research and brainstorm the possibilities for the next generation of electronic games based on current and emerging technologies and future predictions.

Societal Impact

07.0 Understand the role of play in human culture. – The student will be able to:

07.01 Discuss the word “play” and its many definitions.
07.02 Discuss the effect of play on today’s culture, specifically why it is important and what it provides in terms of balance in our lives.
07.03 Describe the history of play and its importance in developing societies and cultures.
07.04 Investigate and discuss how play can help humans, particularly children, acquire knowledge.
07.05 Describe the benefits of role-playing games and simulations, including online economies and community-building.

08.0 Understand the psychological impact of games on individuals and groups. – The student will be able to:
08.01 Investigate studies that discuss the impact of violent games on children and adults.
08.02 Compare and contrast the different opinions on the effects of games on behavior, cognitive development, and motor skills.
08.03 Research and discuss differing opinions on video game addiction and what would define addiction.

08.04 Examine online digital worlds such as Second Life and the impact these worlds have on individuals and groups.

Management & Industry

09.0 Understand the business model commonly used in the game development industry. – The student will be able to:

09.01 Identify, define and discuss the different ways games are funded, marketed and sold.
09.02 Identify and describe licensing management for different gaming platforms.
09.03 Discuss the product value and business differences between major game platforms.
09.04 Identify successful business models and analyze various facets of those models, such as market analysis, marketing strategy, and product value.

10.0 Examine and categorize the significant processes in the production of interactive games. – The student will be able to:

10.01 Discuss the relationships between publishers, developers, distributors, marketers, and retailers.
10.02 Identify processes of development including content creation, team roles, design documentation, and process management.
10.03 Explore and describe the effects of globalization on the design and production of video games.

11.0 Understand the core tasks and challenges that face a video game design team. – The student will be able to:

11.01 Identify and define the roles and responsibilities of team members on a video game design team.
11.02 Describe the effects of group dynamics and the importance of team building for a design team.
11.03 Explore and discuss methods of communications and scheduling for design teams.
11.04 Describe the importance and interrelationship between development schedule and budget constraints in video game design.

12.0 Understand legal issues that affect games, developers and players. – The student will be able to:

12.01 Define and discuss intellectual property and contract law as it relates to the gaming industry.
12.02 Describe legal and liability issues that could affect online communities.
12.03 Compare and contrast government and industry content regulation and industry ratings of video games.

13.0 Describe the impact of the video game industry on the economy. – The student will be able to:

13.01 Explore and discuss the impact of video games on the economy including domestic sales, foreign exports, and video game rentals.
13.02 Research and describe the effect of game software in driving new technologies and the purchases of video game hardware, gaming PCs, and complementary technologies such as high-definition televisions.
13.03 Analyze the technological transfers from video games to other industries, such as education, medical, corporate training, and military simulation technologies that were developed by the video game industry, as well as 3D "gaming" graphics cards that have found use for other applications.
13.04 Describe how frequent exposure and/or access to video games has reshaped the level of technical proficiency of our work force.

Job Readiness & Career Development

14.0 Demonstrate the professional level of written and oral communication required in the game development industry. – The student will be able to:

14.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
14.02 Organize ideas and communicate oral and written messages appropriate for the game development industry environment
14.03 Identify, define, and discuss terminology appropriate for both internal and external communications in the game development industry environment.

15.0 Demonstrate human relations/interpersonal skills for the workplace. – The student will be able to:

15.01 Solicit and accept constructive criticism.
15.02 Demonstrate personal and interpersonal skills appropriate for the workplace such as responsibility, dependability, punctuality, positive attitude, initiative, respect for self and others, and professional dress.
15.03 Collaborate with individuals and teams to complete tasks and solve problems.

16.0 Investigate career opportunities in the game industry. – The student will be able to:

16.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
16.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.
16.03 Describe job requirements for a variety of occupations within the game development industry.

Game & Simulation Analysis

17.0 Demonstrate an understanding of the vocabulary for discussing games and play. – The student will be able to:

17.01 Identify, define, and discuss professional game design and analysis terminology appropriate for internal and external communications in a game design environment.

17.02 Identify and define the vocabulary used by game players and online gaming communities.

18.0 Demonstrate an understanding of the techniques used to evaluate game mechanics, game play, flow and game design. – The student will be able to:

18.01 Test and analyze games to determine the quality of rules, interfaces, navigation, performance, play, artistry and longevity in design and structure.
18.02 Research and evaluate the game analysis techniques used by the video game industry.
18.03 Identify the key elements in a game and make intelligent judgments about whether the game succeeded or failed in its objectives.
18.04 Evaluate professional reviews and write a critical analysis of a current video game.

19.0 Describe the complex interaction between video games and players and the role it plays in the popularity of a game. – The student will be able to:

19.01 Analyze and deconstruct game environments and interactions.
19.02 Compare and contrast the top selling video games in terms of player interaction, plot complexity, and reward.

Game & Simulation Design

20.0 Understand the general procedure and requirements of game design. – The student will be able to:

20.01 Describe the design process from conception to production.
20.02 Discuss the iterative nature of game and simulation design.
20.03 Develop design plans, character sketches, documentation and storyboards for proposed games.

21.0 Explore the methods used to create and sustain player immersion. – The student will be able to:

21.01 Research and define the term “player immersion”.
21.02 Explore and explain the factors that create player immersion in a game.
21.03 Examine popular games and explain the methods each game uses to increase player immersion.

22.0 Become familiar with popular game tools such as DirectX, 3DMAX, and different gaming engines. – The student will be able to:

22.01 Identify and discuss the popular game development tools currently used in the industry.
22.02 Identify and discuss popular gaming engines.
22.03 Research and analyze the uses for different game development tools.

23.0 Demonstrate an understanding of interface design and hardware constraints on video games including processors and I/O devices. – The student will be able to:

23.01 Identify the different control systems for video games.

23.02 Compare and contrast personal computer and video game console hardware.
23.03 Explain the factors that can limit the game playing ability of personal computers.
23.04 Chart the evolution of video game hardware over the past 20 years.

74.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

74.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
74.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
74.03 Present information formally and informally for specific purposes and audiences. AF2.9

75.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

75.01 Demonstrate knowledge of arithmetic operations. AF3.2
75.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
75.03 Construct charts/tables/graphs using functions and data. AF3.5

76.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

76.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
76.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Game & Simulation Design**
Course Number: **8208120**
Course Credit: **1**

Course Description:

This course covers fundamental principles of designing a game or a simulation application, in particular Human Computer Interface (HCI) principles, rules and strategies of play, conditional branching, design and development constraints, use of sound and animation, design tools, and implementation issues. The content includes market research, product design documentation, storyboarding, proposal development, and presentation of a project report. Emphasis is placed on the techniques needed to develop well-documented, structured game or simulation programs. Extensive use is made of evaluating and analyzing existing games or simulations.

Hands-on activities using an entry-level game development tool such as Game Maker or Alice should be integrated into the curriculum. **Regardless of topic sequencing, the culminating activity is the creation and presentation of a playable game with design documentation.**

Game/Simulation Project

Instruction relating to the standards in this section should be interspersed throughout the entire course with the other standards taught progressively in the context of game design and development.

24.0 Create a working game or simulation individually or as part of a team. – The student will be able to:

- 24.01 Create a storyboard describing the essential elements, plot, flow, and functions of the game/simulation.
- 24.02 Create a design specification document to include interface and delivery choices, rules of play, navigation functionality, scoring, media choices, start and end of play, special features, and development team credits.
- 24.03 Using a simple game development tool, create a game or simulation.
- 24.04 Present the game or simulation.

Design Essentials

25.0 Describe the game development life cycle. – The student will be able to:

- 25.01 Identify steps in the pre-production process including the proof of concept and market research.
- 25.02 Describe the iterative prototyping process – Alpha, Beta, RTM.
- 25.03 Determine scripting requirements.
- 25.04 Implement techniques of scenario development, levels, and missions.
- 25.05 Discuss game testing requirements and methods.
- 25.06 Identify and describe maintenance, upgrade and sequel issues.

26.0 Identify hardware constraints on video games including processors and I/O devices. – The student will be able to:

26.01 Identify the different control systems for video games.
26.02 Compare and contrast personal computer and video game console hardware, including display systems.
26.03 Explain the factors that can limit the game-playing ability of personal computers.

27.0 Identify non-hardware development constraints. – The student will be able to:

27.01 Identify and discuss software integration issues relating to scripting, sound, art animation, game engine and world design software integration.
27.02 Describe constraints such as development time, personnel, talent acquisition, financial/budget constraints, and schedule.
27.03 Describe societal and legal constraints affecting game and simulation design.

Game Design Documentation

28.0 Understand the general principles of storytelling. – The student will be able to:

28.01 Identify the essential elements of a story.
28.02 Describe how creative writing is used as a game design tool.
28.03 Compare and contrast methods of delivering a story in a game.

29.0 Understand the use of storyboarding in game design. – The student will be able to:

29.01 Assess the techniques used in the gaming industry for rendering basic Game Design Art.
29.02 Describe how game layout charts are used in game design.
29.03 Describe how storyboards in the game design process can be used as a pre-development sales tool.
29.04 Analyze and compare the use of storyboards in the game design industry with regard to environmental illustrations, level designs, character designs, model sheets and GUI Designs.

30.0 Develop a game design document or blueprint. – The student will be able to:

30.01 Evaluate and discuss the choice of delivery system.
30.02 Evaluate and discuss choices of genre, game design software, art, digital media, and animation software.
30.03 Create a game strategy overview, character overview, and storyboard overview.
30.04 Define the rules of play and multi-player options.
30.05 Create the layout and interfaces overview and digital media overview.
30.06 Determine the event modeling requirements and create the progression levels overview.
30.07 Define strategic positioning of game immersion dynamics and psychological effect.
30.08 Identify hardware and software constraints.

Game Strategy

31.0 Understand strategic outlining in game designs. – The student will be able to:

31.01 Assess techniques of goal design in gaming.
31.02 Describe the concept of nested victories.
31.03 Discuss the use of players as agents of change.
31.04 Compare and contrast examples of understandable context in gaming.
31.05 Discuss the principles underlying the creation of understandable rules.
31.06 Describe how skill building is used in game design.
31.07 Describe conventional techniques of positive feedback.
31.08 Discuss functional consistency as it relates to the use of interfaces.

32.0 Explore elements of puzzle design. – The student will be able to:

32.01 Describe the essential elements of a puzzle.
32.02 Identify the different types of puzzles.
32.03 Describe the basic principles of high-level puzzle design.
32.04 Describe the basic principles of low-level puzzle design.

33.0 Discuss key strategic considerations in game design. – The student will be able to:

33.01 Describe the use of artificial intelligence challenges in game design and the need for giving the player rest time between challenges.
33.02 Evaluate the impact of randomness in game design especially as it pertains to pattern recognition.
33.03 Identify techniques used in the industry to help the player to navigate.
33.04 Explain the use of “just barely” victories as an exciting and immersive technique.
33.05 Assess techniques used to provide a range of challenges and appeal to a wide range of abilities.
33.06 Describe the psychological cost of failure in games as it pertains to immersion and psychological effect.
33.07 Identify methods of preparing the player for greater challenge while allowing for plot development as the story serves the game.

Rules of Play

34.0 Understand the process of creating and designing player actions. – The student will be able to:

34.01 Discuss the principles of player-centric design.
34.02 Research and correlate game complexity level to appropriate age group such that content matches user skill set required.
34.03 Examine and discuss design elements that encourage continuous active engagement both mental and physical.
34.04 Analyze design elements that maintain player interest and vary the degree of challenge.
34.05 Discuss the need for a balance of design elements for the purpose of rewarding and frustrating players.

35.0 Create and design the game flow as it relates to story and plot. – The student will be able to:

35.01 Identify techniques of introducing the story plot and beginning play.
35.02 Describe story plot development techniques for the middle of play in game design.
35.03 Analyze and discuss planning techniques for climax and finale of games.

36.0 Assess common principles and procedures in game flow design. – The student will be able to:

36.01 Assess missions and scenarios game flow techniques.
36.02 Describe common use of mission design and campaigns.
36.03 Evaluate usage of static versus dynamic campaigns.

37.0 Describe rule creation elements of player challenge. – The student will be able to:

37.01 Research common design methods for clearing obstacles or series of obstacles.
37.02 Describe common design elements introducing skill, luck and combinations including escalating challenges to games.
37.03 Identify common design elements used to vary weapons, characters and tools.
37.04 Discuss the incorporation of risk reward and adaptive challenges (AI).
37.05 Evaluate industry use of boss encounters in games.
37.06 Analyze and discuss design considerations from the perspective of other players and multi-player environments.

Game Development Tools

38.0 Identify tools and software commonly used in game development. – The student will be able to:

38.01 Identify and discuss the popular game development tools currently used in the industry.
38.02 Identify and discuss popular gaming engines.
38.03 Identify and discuss popular world building tools.

Music, Sound, Art & Animation

39.0 Understand the methodologies for integrating digital media into a game or simulation. – The student will be able to:

39.01 Survey and discuss the use of naming conventions and temp sounds.
39.02 Analyze and discuss methods of matching sound effects to art assets.
39.03 Identify and categorize commonly used technology sound engine integration equipment.
39.04 Identify and discuss resources such as sound effects libraries.
39.05 Examine methods of sound implementation and associated software.
39.06 Describe how and why digital video may be integrated into a game or simulation design.
39.07 Describe how special effects differ from animation.

40.0 Identify commonly used art and animation production tools in the game design industry. – The student will be able to:

40.01 Identify, categorize and discuss art and animation tools commonly used in game design.

Environmental Design

41.0 Understand the general concepts of environmental design. – The student will be able to:

41.01 Survey and evaluate commonly used concept art.
41.02 Create a world sketch with particular attention to maintaining continuity of style.
41.03 Describe the emotional/psychological aspects of environmental design that signify mood, façade of freedom, and resource struggling.

42.0 Describe how environmental design is used in conjunction with game level design. – The student will be able to:

42.01 Examine and evaluate examples of focus on a theme.
42.02 Describe methods of creating a purposeful architecture giving consideration to continuity and themes and taking advantage of revisiting.
42.03 Consider and discuss environmental design elements for multi-player or single player games.
42.04 Describe the history of creating shifts in game design environments and embracing novel ideas.
42.05 Identify and discuss environmental design pitfalls such as red herrings and cookie-cutter layouts.

Event Modeling in Game Design

43.0 Define the meaning of simulation and pertinent issues facing game designers. – The student will be able to:

43.01 Discuss the meaning of simulation and give examples of simulation and complexity including architecture, exposure, concealment and heuristics.
43.02 Describe applied event modeling including goal discovery, map making, event exploration, developing incentives and learning in event modeling for games.
43.03 Explain the concepts of modes of understanding, inductive and iconic logic, significance and saturation in event modeling for game design.

44.0 Describe applied event modeling as it relates to game design. – The student will be able to:

44.01 Discuss the process of specifying events including contexts of simulation, translating event models to simulations, formalizing thematic objectives, prototyping, interface design and use cases with modeling.
44.02 Describe the design of an application framework including extensible frameworks, software design, configuration, encapsulation, windows and message loops.
44.03 Describe the implementation of an application framework including adding graphics, GUI events and controls, and creating a console.
44.04 Discuss the process of designing entities including behavior and entity graphics.

44.05 Describe the implementation of entities including enumerating animations, playing with time, creating events, adding an entity class, and creating entity events and behaviors.
44.06 Analyze event modeling in creating a world including the creation of a world class, adding and removing entities, accessing entities, updating and rendering, adding scene hierarchies and handling world events.
44.07 Assess and discuss AI and physics issues for simulation including AI event contexts, adding intelligence and gravity, adding collision detection, updating for collisions and applying mass and force.
44.08 Discuss environmental elements of simulation including logic, cognitive saturation, systems and interpretation, context of reality, shadows and lighting.
44.09 Discuss the simulation of physical systems such as trees and forests and related events such as fires, or insect swarms such as beehives, bird flocks or anthills.
44.10 Describe the simulation of social and economic systems including practical applications, historical precedents, modeling for community events, creation of communities including structures, states events and rendering and altering building states, population behaviors, and controlling influences.
44.11 Describe the process of testing simulations and event models including effectiveness, diagrammatic systems evaluation, context influence, path transitions and assessing messages.

Interface Design

45.0 Understand basic HCI principles. – The student will be able to:

45.01 Define and give examples of how HCI principles are considered in designing a game or simulation.
45.02 Describe how client user background, education, goals, motivation, training, culture, age, gender, physical abilities and client sophistication affect interface design.

46.0 Discuss the eight golden rules of HCI. – The student will be able to:

46.01 Discuss the need for functional consistency, shortcuts, feedback, closure, error prevention, easy reversal of actions, feeling in control, and avoiding memory overload.
46.02 Identify game design enhancements that could make better use of HCI Principles.

47.0 Understand the use of inventory systems in game design. – The student will be able to:

47.01 Discuss the various methods of describing items in player's inventory in contemporary game design.
47.02 Review and discuss industry methods of communicating how inventory items can have an effect on game play.

77.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

77.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0

77.02 Locate, organize and reference written information from various sources. CM 3.0
77.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
77.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
77.05 Apply active listening skills to obtain and clarify information. CM 7.0
77.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
77.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

78.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

78.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
78.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
78.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
78.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

79.0 Use information technology tools. – The student will be able to:

79.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
79.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
79.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
79.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

80.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

80.01 Describe the nature and types of business organizations. SY 1.0
80.02 Explain the effect of key organizational systems on performance and quality.
80.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
80.04 Explain the impact of the global economy on business organizations.

83.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

83.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
83.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
83.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
83.04 Interpret and explain written organizational policies and procedures. ELR 2.0

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Game & Simulation 2D Graphic Development**
Course Number: **8208130**
Course Credit: **1**

Course Description:

This course is focused on students acquiring skills to create, refine, and integrate realistic 2D graphics into a game or simulation product. Students will essentially learn how to use a graphic software package, file maintenance strategies, and migration techniques and issues.

48.0 Understand the significance of historical and cultural heritage of art and artistic styles as it relates to 2D game graphics. – The student will be able to:

- 48.01 Identify styles of art and trends such as surrealism, pop art, and expressionism by viewing reproductions, prints, videos, periodicals, books or Internet sites.
- 48.02 Identify art styles from various historical periods.
- 48.03 Use concise vocabulary to compare and contrast artistic elements and design principles in personal works and the works of others.
- 48.04 Explore the details in works noting the use of materials, lighting and features that contribute to the overall feel and mood of the work.

49.0 Understand intellectual property rights, copyright laws and plagiarism as it applies to creative assets. – The student will be able to:

- 49.01 Understand the use of “Fair use and Fair Dealing”.
- 49.02 Understand the transfer and licensing of creative works.
- 49.03 Understand the use of “exclusive rights” to intellectual creations.
- 49.04 Demonstrate the use of digital watermarking.

50.0 Understand the various job titles and responsibilities of a 2D artist as it relates to the game industry. – The student will be able to:

- 50.01 Identify the job titles of visual artist used in a 2D game project.
- 50.02 Demonstrate the ability to work as part of an art team.
- 50.03 Perform the role of the concept artist for a 2D game project.
- 50.04 Perform the role of the art director for a 2D game project.
- 50.05 Perform the role of the texture artist for a 2D game project.
- 50.06 Perform the role of the environment artist for a 2D game project.

51.0 Develop the art direction for a 2D game. – The student will be able to:

- 51.01 Develop a vision for visual elements of a 2D game.
- 51.02 Effectively convey the mood or psychological appeal of the game to the target audience through the use of visual styles.
- 51.03 Create conceptual game art using various techniques, emphasizing space and form through range of value, placement, reflections, and shadows.

51.04 Create character sketches, architectural sketches and background sketches for the concept artist to render from.
51.05 Develop the game design documents, including schedules and technical specifications for the art team.
51.06 Understand the challenges of art direction as it relates to mobile devices.

52.0 Determine and document the graphical and animation needs of a game using design documents including art direction and reference materials. – The student will be able to:

52.01 Understand the design requirements and limitations of a 2D game engine.
52.02 Develop characters and game elements in respect to the art direction laid out in the design documents
52.03 Determine the appropriate file format vector based resolution independent vs. pixel based graphics which are resolution dependent.
52.04 Understand the different aspects of quality and detail in relation to performance and size.
52.05 Understand the role of naming conventions as it applies to creative assets storage used in the work flow.
52.06 Demonstrate the effective us of alternative resolutions, scaling and file formats.

53.0 Understand the fundamentals of drawing and painting techniques. – The student will be able to:

53.01 Demonstrate the use (traditional or digital) of inks, watercolors, acrylics, oils, and mixed media in a 2D game.
53.02 Demonstrate the use of different techniques, format, media or style.
53.03 Understand the use of primitives.
53.04 Demonstrate basic understanding of composition of a scene.
53.05 Understand the shape of the human form.
53.06 Know the value of lights and shadows.

54.0 Demonstrate a working knowledge of vector and paint programs used to make 2D graphics and animation. – The student will be able to:

54.01 Know the difference between Vectors and Bitmaps.
54.02 Demonstrate understanding of various 2D art programs.
54.03 Utilize the programs tools and brushes
54.04 Know the importance of Layers.
54.05 Identify file formats

55.0 2D world building, making graphics and backgrounds for 2D side scrolling, top down, and Isometric projection. – The student will be able to:

55.01 Know the importance of scale in relation to the player.
55.02 Understand 2D level design to successfully lead the player.
55.03 Effectively use 2D graphics to convey mood and story in the game world.

56.0 Understand the principles of Sprite animation as it relates to 2D game graphics (walk, run, Jump, idle…etc.). – The student will be able to:

56.01 Demonstrate the ability to create character and object views from which to animate.
56.02 Break down animation into a series of pictures to import animation to a game engine.
56.03 Demonstrate the effective use of animation loops and cycles in a game engine.
56.04 Demonstrate an understanding of the value of timing to convey character motion
56.05 Demonstrate the effective use of animation arcs for the articulation of body elements
56.06 Demonstrate the use of principles of animation such as anticipation, squash, stretch, weight, exaggeration and overlapping & secondary motion

57.0 Facial animation, expressions, and audio lip syncing. – The student will be able to:

57.01 Know the basics of lip syncing.
57.02 Understand facial land marking
57.03 Demonstrate the ability to show emotions thru the eyes.

58.0 Create graphics for the user interface including titles and button states. – The student will be able to:

58.01 Understanding good menu flow of the user interface
58.02 Designing the ideal HUD (Heads Up Display)
58.03 Wisely using text in the game interface.
58.04 Demonstrate the ability for creating Mock-Ups.

59.0 Particle system design and other in-game effects such as lighting and shadows. – The student will be able to:

59.01 Understand particle design for fire and smoke.
59.02 Create water using 2D particles.
59.03 Know the anatomy of an explosion effect.
59.04 Create a 3D feel in a 2D world using light and shadows.

60.0 Demonstrate the effective use of 2D hardware such as scanners and digital tablets. – The student will be able to:

60.01 Demonstrate the installation, software and hardware associated with digital tablets, scanners, and a digital camera.
60.02 Demonstrate the use of a digital tablet within a paint software application.
60.03 Demonstrate the process of capturing textures using a digital camera.
60.04 Demonstrate the process of importing images from a digital camera into a photo editing software application.
60.05 Demonstrate the proper use of a scanner for image processing.

81.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

81.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
81.02 Explain emergency procedures to follow in response to workplace accidents.

81.03 Create a disaster and/or emergency response plan. SHE 2.0

82.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

82.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
82.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
82.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
82.04 Employ mentoring skills to inspire and teach others. LT 5.0

84.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

84.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
84.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
84.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
84.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
84.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
84.06 Identify and exhibit traits for retaining employment. ECD 7.0
84.07 Identify opportunities and research requirements for career advancement. ECD 8.0
84.08 Research the benefits of ongoing professional development. ECD 9.0
84.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

85.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

85.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
85.02 Describe the effect of money management on personal and career goals. FL 3.0
85.03 Develop a personal budget and financial goals. FL3.1
85.04 Complete financial instruments for making deposits and withdrawals. FL3.2
85.05 Maintain financial records. FL3.3
85.06 Read and reconcile financial statements. FL3.4
85.07 Research, compare and contrast investment opportunities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Game & Simulation 3D Graphic Animation**
Course Number: **8208140**
Course Credit: **1**

Course Description:

This course is focused on students acquiring skills to create, refine, and integrate realistic 3D graphics into a game or simulation product. Students will essentially learn how to use a 3D animation software package, file maintenance conventions, and migration techniques and issues.

61.0 Understand the significance of historical and cultural heritage of art and artistic styles as it relates to 3D game graphics. – The student will be able to:

- 61.01 Identify styles of art and trends such as surrealism, pop art, and expressionism by viewing reproductions, prints, videos, periodicals, books or Internet sites.
- 61.02 Identify art styles from various historical periods.
- 61.03 Use concise vocabulary to compare and contrast artistic elements and design principles in personal works and the works of others.
- 61.04 Explore the details in works noting the use of materials, lighting and features that contribute to the overall feel and mood of the work.

62.0 Understand intellectual property rights, copyright laws and plagiarism as it applies to creative assets. – The student will be able to:

- 62.01 Understand the use of “Fair use and Fair Dealing”.
- 62.02 Understand the transfer and licensing of creative works.
- 62.03 Understand the use of “exclusive rights” to intellectual creations.
- 62.04 Demonstrate the use of digital watermarking.

63.0 Understand the various job titles and responsibilities of a 3D artist as it relates to the game industry. – The student will be able to:

- 63.01 Identify the job titles of visual artist used in a 3D game project.
- 63.02 Demonstrate the ability to work as part of an art team.
- 63.03 Perform the role of the concept artist for a 3D game project.
- 63.04 Perform the role of the art director for a 3D game project.
- 63.05 Perform the role of the texture artist for a 3D game project.
- 63.06 Perform the role of the environment artist for a 3D game project.

64.0 Develop the art direction for a 3D game. – The student will be able to:

- 64.01 Develop a vision for visual elements of a 3D game.
- 64.02 Effectively convey the mood or psychological appeal of the game to the target audience through the use of visual styles.

64.03 Create conceptual game art using various techniques, emphasizing space and form through range of value, placement, reflections, and shadows.
64.04 Create character sketches, architectural sketches and background sketches for the concept artist to render from.
64.05 Develop the game design documents, including schedules and technical specifications for the art team.
64.06 Understand the challenges of art direction as it relates to mobile devices.

65.0 Determine and document the graphical and animation needs of a game using design documents including art direction and reference materials. – The student will be able to:

65.01 Understand the design requirements and limitations of a 3D game engine.
65.02 Develop characters and game elements in respect to the art direction laid out in the design documents
65.03 Determine the appropriate file format as it applies to pixel based graphics, which are resolution dependent.
65.04 Understand the different aspects of quality and detail in relation to performance and size.
65.05 Understand the role of naming conventions as it applies to creative assets storage used in the work flow.
65.06 Demonstrate the effective us of alternative resolutions, scaling and file formats.

66.0 Understand the fundamentals of drawing and painting techniques. – The student will be able to:

66.01 Demonstrate the use (traditional or digital) of inks, watercolors, acrylics, oils, and mixed media in a 3D game.
66.02 Demonstrate the use of different techniques, format, media or style.
66.03 Understand the use of primitives.
66.04 Demonstrate basic understanding of composition of a scene.
66.05 Understand the shape of the human form.
66.06 Know the value of lights and shadows.

67.0 Demonstrate a working knowledge of modeling and paint programs used to make 3D graphics and animation. – The student will be able to:

67.01 Understand the limitation of bitmaps graphics.
67.02 Understand the use and application of bump map images applied to a model.
67.03 Demonstrate understanding of various 3D art programs.
67.04 Utilize the programs tools and brushes
67.05 Know the importance of Layers.
67.06 Identify file formats

68.0 3D world building, making graphics and backgrounds for 3D side scrolling, top down, and Isometric projection. – The student will be able to:

68.01 Know the importance of scale in relation to the player.
68.02 Understand 3D level design to successfully lead the player.
68.03 Effectively use 3D graphics to convey mood and story in the game world.

69.0 Understand the principles of Sprite animation as it relates to 3D game graphics (walk, run, Jump, idle…etc.). – The student will be able to:

- 69.01 Demonstrate the ability to create character and object views from which to animate.
- 69.02 Break down animation into a series of pictures to import animation to a game engine.
- 69.03 Demonstrate the effective use of animation loops and cycles in a game engine.
- 69.04 Demonstrate an understanding of the value of timing to convey character motion.
- 69.05 Demonstrate the effective use of animation arcs for the articulation of body elements.
- 69.06 Demonstrate the use of principles of animation such as anticipation, squash, stretch, weight, exaggeration and overlapping & secondary motion.
- 69.07 Understand the use of motion capture techniques and acting principles.

70.0 Facial animation, expressions, and audio lip syncing. – The student will be able to:

- 70.01 Know the basics of lip syncing.
- 70.02 Understand facial land marking
- 70.03 Demonstrate the ability to show emotions thru the eyes.
- 70.04 Demonstrate the use of motion capture data as it applies to facial animation.

71.0 Create graphics for the user interface including titles and button states. – The student will be able to:

- 71.01 Understanding good menu flow of the user interface
- 71.02 Designing the ideal HUD (Heads Up Display)
- 71.03 Wisely using text in the game interface.
- 71.04 Demonstrate the ability for creating Mock-Ups.

72.0 Particle system design and other in-game effects such as lighting and shadows. – The student will be able to:

- 72.01 Understand particle design for fire and smoke.
- 72.02 Create water using 3D particles.
- 72.03 Know the anatomy of an explosion effect.
- 72.04 Create a photorealistic or artistic style in a 3D world using light, shadows, bump maps, and textures.

73.0 Demonstrate the effective use of 3D hardware such as scanners and digital tablets. – The student will be able to:

- 73.01 Demonstrate the installation, software and hardware associated with digital tablets, scanners, and a digital camera.
- 73.02 Demonstrate the use of a digital tablet within a paint software application.
- 73.03 Demonstrate the process of capturing textures using a digital camera.
- 73.04 Demonstrate the process of importing images from a digital camera into a photo editing software application.
- 73.05 Demonstrate the proper use of a scanner for image processing.
- 73.06 Understand the use of motion capture systems, optical, mechanical, mark less as it applies to 3D animation content.

73.07 Understand the use of 3D scanners to create objects and apply textures images captured from the device.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Game/Simulation/Animation Audio/Video Effects**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	8208200	B082200
CIP Number	0507.039915	0507.039915
Grade Level	9-12, 30, 31	30, 31
Standard Length	4 credits	600 hours
Teacher Certification	BUS ED 1 @2 COMPU SCI 6 COMM ART @7 G TV PRO TEC @ 7 G	BUS ED 1 @2 COMPU SCI 6 COMM ART @7 G TV PRO TEC @ 7 G
CTSO	FBLA BPA	Phi Beta Lambda BPA
SOC Codes (all applicable)	15-1099.13; 27-1014	15-1099.13; 27-1014
Facility Code	212 http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	Mathematics: 10.0 Language: 10.0 Reading: 10.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as a Game/Simulation Designer, Digital Media Artist, and Digital Media Specialist in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to practical experiences in game/simulation conceptualization, design, storyboarding, development methodologies, audio/sound effects design and production, video/special effects design and production, and implementation issues. Specialized skills involving audio and video editing equipment and software are used to produce a variety of intrinsic and special audio/video effects.

This program is project-based and focuses on broad, transferable skills and stresses understanding and demonstration of the following rudiments of the game and simulation industry: production planning, elements of production design, storyboarding, elements of visual design, integration of digital audio and digital video into new game/simulation productions, and collaboration/teamwork.

Program Structure

This program is a planned sequence of instruction consisting of three occupational completion points. Students enrolling in this program must be computer literate. This literacy can be achieved by completing one credit of the Business Technology Education core. This includes Computing for College & Careers (8209020) or Introduction to Information Technology (8207310). It is also recommended that students complete core courses in digital arts, computer arts, or digital media. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or exit as an occupational completer.

When offered at the post secondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	DIG0070	Game/Simulation Designer	300	27-1021
B	DIG0073	Digital Media Artist	150	27-1014
C	DIG0074	Digital Media Specialist	150	27-1014

** Note: OTA0040 is a highly recommended core program*

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8208110 8208120	Game & Simulation Foundations Game & Simulation Design	1 credit 1 credit	27-1021	2
B	8208230	Game & Simulation Audio/Sound Effects	1 credit	27-1014	2
C	8208240	Game & Simulation Video/Special Effects	1 credit	27-1014	2

** Note: It is highly recommended that students complete the BTE Core, either Computing for College and Careers (8209020) or Introduction to Information Technology (8207310), prior to or concurrently with the first two courses.*

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Program Recommendations

The Game/Simulation/Animation Audio/Video Effects program lends itself to integration of the core academic subjects of language arts, math, science, visual arts, and social studies into project activities. It is through a balanced and integrated curriculum that students attain the attitudes, skills, and knowledge needed to compete successfully in today's work force. To achieve total curriculum integration, academic and career and technical education teachers should be scheduled with common planning times.

This program emphasizes the development of technical abilities as well as ethical and societal awareness necessary to function in a highly technological society. The use of cooperative learning groups is recommended. By learning and practicing group process skills, students will be prepared to work "together" in real work situations. Program graduates will develop enhanced self-esteem as well as the problem solving and teamwork skills necessary to succeed in careers and postsecondary education.

The Game/Simulation/Animation Audio/Video Effects program places a strong emphasis on workplace learning. Job shadowing and mentoring experiences with game and simulation professionals along with on-site trips to local businesses connect classroom learning to the workplace. In-class guest speakers bring the real world into the classroom.

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills to secondary students. For postsecondary students, Phi Beta Lambda and BPA are the appropriate student organizations. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 10.0, Language 10.0, and Reading 10.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

The PSAV component of this program has no statewide articulation agreement approved by the Articulation Coordinating Committee. However, this does not preclude the awarding of credits by any college through local agreements.

For details on statewide articulation agreements which correlate to programs and industry certifications, refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Create a game design production plan that describes the game play, outcomes, controls, interface and artistic style of a video game.
02.0 Design and create a playable game.
03.0 Categorize the different gaming genres.
04.0 Categorize different gaming systems.
05.0 Understand the historical significance of electronic and non-electronic games.
06.0 Describe the trends in current and next-generation game development.
07.0 Understand the role of play in human culture.
08.0 Understand the psychological impact of games on individuals and groups.
09.0 Understand the business model commonly used in the game development industry.
10.0 Examine and categorize the significant processes in the production of interactive games.
11.0 Understand the core tasks and challenges that face a video game design team.

12.0 Understand legal issues that affect games, developers and players.
13.0 Describe the impact of the video game industry on the economy.
14.0 Demonstrate the professional level of written and oral communication required in the game development industry.
15.0 Demonstrate human relations/interpersonal skills for the workplace.
16.0 Investigate career opportunities in the game industry.
17.0 Demonstrate an understanding of the vocabulary for discussing games and play.
18.0 Demonstrate an understanding of the techniques used to evaluate game mechanics, game play, flow, and game design.
19.0 Describe the complex interaction between video games and players and the role it plays in the popularity of a game.
20.0 Understand the general procedure and requirements of game design.
21.0 Explore the methods used to create and sustain player immersion.
22.0 Become familiar with popular game tools such as DirectX, 3DMax, and different gaming engines.
23.0 Demonstrate an understanding of interface design and hardware constraints on video games including processors and I/O devices.
24.0 Create a working game or simulation individually or as part of a team.
25.0 Describe the game development life cycle.
26.0 Identify hardware constraints on video games including processors and I/O devices.
27.0 Identify non-hardware development constraints.
28.0 Understand the general principles of storytelling.
29.0 Understand the use of storyboarding in game design.
30.0 Develop a game design document or blueprint.
31.0 Understand strategic outlining in game designs.
32.0 Explore elements of puzzle design.
33.0 Discuss key strategic considerations in game design.
34.0 Understand the process of creating and designing player actions.
35.0 Create and design the game flow as it relates to story and plot.
36.0 Assess common principles and procedures in game flow design.
37.0 Describe rule creation elements of player challenge.
38.0 Identify tools and software commonly used in game development.
39.0 Understand the methodologies for integrating digital media into a game or simulation.
40.0 Identify commonly used art and animation production tools in the game design industry.
41.0 Understand the general concepts of environmental design.
42.0 Describe how environmental design is used in conjunction with game level design.
43.0 Define the meaning of simulation and pertinent issues facing game designers.
44.0 Describe applied event modeling as it relates to game design.
45.0 Understand basic HCI principles.
46.0 Discuss the eight golden rules of HCI.
47.0 Understand the use of inventory systems in game design.
48.0 Understand the history of audio/sound effects in the entertainment industry.
49.0 Perform various job roles typical for an audio technician on a game/ simulation project.
50.0 Understand intellectual property rights, copyright laws, and plagiarism as they apply to creative assets.
51.0 Demonstrate a knowledge of production writing as it relates to game and simulation design.
52.0 Demonstrate appropriate voice acting skills.
53.0 Demonstrate basic audio production.
54.0 Set-up and configure a computer for audio applications.
55.0 Operate an audio workstation.

56.0 Demonstrate application of MIDI in a game/simulation project.
57.0 Incorporate audio assets into game/simulation engine.
58.0 Understand the history of video effects in the entertainment.
59.0 Understand the various job titles and responsibilities video technician as it relates to game and simulation design.
60.0 Understand intellectual property rights, copyright laws and plagiarism as it applies to creative assets.
61.0 Demonstrate a knowledge of production writing as it relates to game and simulation design.
62.0 Demonstrate appropriate acting skills.
63.0 Demonstrate basic video production.
64.0 Demonstrate set-up and configuration of a computer for video applications.
65.0 Demonstrate the basic operation of a video workstation.
66.0 Incorporate video assets into game/simulation engine.
67.0 Demonstrate language arts knowledge and skills.
68.0 Demonstrate mathematics knowledge and skills.
69.0 Demonstrate science knowledge and skills.
70.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
71.0 Solve problems using critical thinking skills, creativity and innovation.
72.0 Use information technology tools.
73.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
74.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
75.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
76.0 Describe the importance of professional ethics and legal responsibilities.
77.0 Explain the importance of employability skill and entrepreneurship skills.
78.0 Demonstrate personal money-management concepts, procedures, and strategies.

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Florida Department of Education
Student Performance Standards

Program Title: **Game, Simulation & Animation Audio/Video Effects**
PSAV Number: **B082200**

Course Number: DIG0070
Occupational Completion Point – A
Game/Simulation Designer – 300 Hours – SOC Code 27-1021

Game & Simulation Creation

Instruction relating to the standards in this section should be interspersed throughout the entire course with the other standards taught progressively in the context of game design and development.

01.0 Create a game design production plan that describes the game play, outcomes, controls, interface and artistic style of a video game. – The student will be able to:

- 01.01 Use industry standard game design production documents to create a game design production plan.

02.0 Design and create a playable game. – The student will be able to:

- 02.01 Use a number of computer tools to enhance and ease game programming and artistry.
- 02.02 Use a game engine to create a playable game.
- 02.03 Use animated objects.
- 02.04 Program sound and music to enhance the game experience.
- 02.05 Test and debug the completed game.

Critical Game & Simulation Studies

03.0 Categorize the different gaming genres. – The student will be able to:

- 03.01 Research, compare and categorize the different gaming genres.
- 03.02 Analyze examples of different gaming genres.
- 03.03 Define and use the necessary vocabulary related to gaming and the different genres.

04.0 Categorize different gaming systems. – The student will be able to:

- 04.01 Research, compare and categorize different gaming systems.
- 04.02 Analyze the distinctive features of each system.
- 04.03 Define the target audience for different systems based on features, available games, and price of system and games.
- 04.04 Define and use the necessary vocabulary related to gaming hardware.

05.0 Understand the historical significance of electronic and non-electronic games. – The student will be able to:

05.01 Discuss the history of non-electronic games.
05.02 Describe the history and theory of mainstream and experimental media including radio, movies, television, art, and theatre.
05.03 Explain the historical timeline of electronic games, marking the significant highlights in their evolution.

06.0 Describe the trends in current and next-generation game development. – The student will be able to:
06.01 Determine and analyze the significant trends in game development in the past two decades.
06.02 Research and brainstorm the possibilities for the next generation of electronic games based on current and emerging technologies and future predictions.

Societal Impact

07.0 Understand the role of play in human culture. – The student will be able to:

07.01 Discuss the word "play" and its many definitions.
07.02 Discuss the effect of play on today's culture, specifically why it is important and what it provides in terms of balance in our lives.
07.03 Describe the history of play and its importance in developing societies and cultures.
07.04 Investigate and discuss how play can help humans, particularly children, acquire knowledge.
07.05 Describe the benefits of role-playing games and simulations, including online economies and community-building.

08.0 Understand the psychological impact of games on individuals and groups. – The student will be able to:

08.01 Investigate studies that discuss the impact of violent games on children and adults.
08.02 Compare and contrast the different opinions on the effects of games on behavior, cognitive development, and motor skills.
08.03 Research and discuss differing opinions on video game addiction and what would define addiction.
08.04 Examine online digital worlds such as Second Life and the impact these worlds have on individuals and groups.

Management & Industry

09.0 Understand the business model commonly used in the game development industry. – The student will be able to:

09.01 Identify, define and discuss the different ways games are funded, marketed and sold.
09.02 Identify and describe licensing management for different gaming platforms.
09.03 Discuss the product value and business differences between major game platforms.

09.04 Identify successful business models and analyze various facets of those models, such as market analysis, marketing strategy, and product value.

10.0 Examine and categorize the significant processes in the production of interactive games. – The student will be able to:

10.01 Discuss the relationships between publishers, developers, distributors, marketers, and retailers.
10.02 Identify processes of development including content creation, team roles, design documentation, and process management.
10.03 Explore and describe the effects of globalization on the design and production of video games.

11.0 Understand the core tasks and challenges that face a video game design team. – The student will be able to:

11.01 Identify and define the roles and responsibilities of team members on a video game design team.
11.02 Describe the effects of group dynamics and the importance of team building for a design team.
11.03 Explore and discuss methods of communications and scheduling for design teams.
11.04 Describe the importance and interrelationship between development schedule and budget constraints in video game design.

12.0 Understand legal issues that affect games, developers and players. – The student will be able to:

12.01 Define and discuss intellectual property and contract law as it relates to the gaming industry.
12.02 Describe legal and liability issues that could affect online communities.
12.03 Compare and contrast government and industry content regulation and industry ratings of video games.

13.0 Describe the impact of the video game industry on the economy. – The student will be able to:

13.01 Explore and discuss the impact of video games on the economy including domestic sales, foreign exports, and video game rentals.
13.02 Research and describe the effect of game software in driving new technologies and the purchases of video game hardware, gaming PCs, and complementary technologies such as high-definition televisions.
13.03 Analyze the technological transfers from video games to other industries, such as education, medical, corporate training, and military simulation technologies that were developed by the video game industry, as well as 3D "gaming" graphics cards that have found use for other applications.
13.04 Describe how frequent exposure and/or access to video games has reshaped the level of technical proficiency of our work force.

Job Readiness & Career Development

14.0 Demonstrate the professional level of written and oral communication required in the game development industry. – The student will be able to:

14.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
14.02 Organize ideas and communicate oral and written messages appropriate for the game development industry environment
14.03 Identify, define, and discuss terminology appropriate for both internal and external communications in the game development industry environment.

15.0 Demonstrate human relations/interpersonal skills for the workplace. – The student will be able to:

15.01 Solicit and accept constructive criticism.
15.02 Demonstrate personal and interpersonal skills appropriate for the workplace such as responsibility, dependability, punctuality, positive attitude, initiative, respect for self and others, and professional dress.
15.03 Collaborate with individuals and teams to complete tasks and solve problems.

16.0 Investigate career opportunities in the game industry. – The student will be able to:

16.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
16.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.
16.03 Describe job requirements for a variety of occupations within the game development industry.

Game & Simulation Analysis

17.0 Demonstrate an understanding of the vocabulary for discussing games and play. – The student will be able to:

17.01 Identify, define, and discuss professional game design and analysis terminology appropriate for internal and external communications in a game design environment.
17.02 Identify and define the vocabulary used by game players and online gaming communities.

18.0 Demonstrate an understanding of the techniques used to evaluate game mechanics, game play, flow and game design. – The student will be able to:

18.01 Test and analyze games to determine the quality of rules, interfaces, navigation, performance, play, artistry and longevity in design and structure.
18.02 Research and evaluate the game analysis techniques used by the video game industry.
18.03 Identify the key elements in a game and make intelligent judgments about whether the game succeeded or failed in its objectives.
18.04 Evaluate professional reviews and write a critical analysis of a current video game.

19.0 Describe the complex interaction between video games and players and the role it plays in the popularity of a game. – The student will be able to:

19.01 Analyze and deconstruct game environments and interactions.
19.02 Compare and contrast the top selling video games in terms of player interaction, plot complexity, and reward.

Game & Simulation Design

20.0 Understand the general procedure and requirements of game design. – The student will be able to:

20.01 Describe the design process from conception to production.
20.02 Discuss the iterative nature of game and simulation design.
20.03 Develop design plans, character sketches, documentation and storyboards for proposed games.

21.0 Explore the methods used to create and sustain player immersion. – The student will be able to:

21.01 Research and define the term “player immersion”.
21.02 Explore and explain the factors that create player immersion in a game.
21.03 Examine popular games and explain the methods each game uses to increase player immersion.

22.0 Become familiar with popular game tools such as DirectX, 3DMAX, and different gaming engines. – The student will be able to:

22.01 Identify and discuss the popular game development tools currently used in the industry.
22.02 Identify and discuss popular gaming engines.
22.03 Research and analyze the uses for different game development tools.

23.0 Demonstrate an understanding of interface design and hardware constraints on video games including processors and I/O devices. – The student will be able to:

23.01 Identify the different control systems for video games.
23.02 Compare and contrast personal computer and video game console hardware.
23.03 Explain the factors that can limit the game playing ability of personal computers.
23.04 Chart the evolution of video game hardware over the past 20 years.

Game/Simulation Project

Instruction relating to the standards in this section should be interspersed throughout the entire course with the other standards taught progressively in the context of game design and development.

24.0 Create a working game or simulation individually or as part of a team. – The student will be able to:

24.01 Create a storyboard describing the essential elements, plot, flow, and functions of the game/simulation.
24.02 Create a design specification document to include interface and delivery choices, rules of play, navigation functionality, scoring, media choices, start and end of play, special features, and development team credits.
24.03 Using a simple game development tool, create a game or simulation.
24.04 Present the game or simulation.

Design Essentials

25.0 Describe the game development life cycle. – The student will be able to:

25.01 Identify steps in the pre-production process including the proof of concept and market research.
25.02 Describe the iterative prototyping process – Alpha, Beta, RTM.
25.03 Determine scripting requirements.
25.04 Implement techniques of scenario development, levels, and missions.
25.05 Discuss game testing requirements and methods.
25.06 Identify and describe maintenance, upgrade and sequel issues.

26.0 Identify hardware constraints on video games including processors and I/O devices. – The student will be able to:

26.01 Identify the different control systems for video games.
26.02 Compare and contrast personal computer and video game console hardware, including display systems.
26.03 Explain the factors that can limit the game-playing ability of personal computers.

27.0 Identify non-hardware development constraints. – The student will be able to:

27.01 Identify and discuss software integration issues relating to scripting, sound, art animation, game engine and world design software integration.
27.02 Describe constraints such as development time, personnel, talent acquisition, financial/budget constraints, and schedule.
27.03 Describe societal and legal constraints affecting game and simulation design.

Game Design Documentation

28.0 Understand the general principles of storytelling. – The student will be able to:

28.01 Identify the essential elements of a story.
28.02 Describe how creative writing is used as a game design tool.
28.03 Compare and contrast methods of delivering a story in a game.

29.0 Understand the use of storyboarding in game design. – The student will be able to:

29.01 Assess the techniques used in the gaming industry for rendering basic Game Design Art.
29.02 Describe how game layout charts are used in game design.
29.03 Describe how storyboards in the game design process can be used as a pre-development sales tool.

29.04 Analyze and compare the use of storyboards in the game design industry with regard to environmental illustrations, level designs, character designs, model sheets and GUI Designs.

30.0 Develop a game design document or blueprint. – The student will be able to:

30.01 Evaluate and discuss the choice of delivery system.
30.02 Evaluate and discuss choices of genre, game design software, art, digital media, and animation software.
30.03 Create a game strategy overview, character overview, and storyboard overview.
30.04 Define the rules of play and multi-player options.
30.05 Create the layout and interfaces overview and digital media overview.
30.06 Determine the event modeling requirements and create the progression levels overview.
30.07 Define strategic positioning of game immersion dynamics and psychological effect.
30.08 Identify hardware and software constraints.

Game Strategy

31.0 Understand strategic outlining in game designs. – The student will be able to:

31.01 Assess techniques of goal design in gaming.
31.02 Describe the concept of nested victories.
31.03 Discuss the use of players as agents of change.
31.04 Compare and contrast examples of understandable context in gaming.
31.05 Discuss the principles underlying the creation of understandable rules.
31.06 Describe how skill building is used in game design.
31.07 Describe conventional techniques of positive feedback.
31.08 Discuss functional consistency as it relates to the use of interfaces.

32.0 Explore elements of puzzle design. – The student will be able to:

32.01 Describe the essential elements of a puzzle.
32.02 Identify the different types of puzzles.
32.03 Describe the basic principles of high-level puzzle design.
32.04 Describe the basic principles of low-level puzzle design.

33.0 Discuss key strategic considerations in game design. – The student will be able to:

33.01 Describe the use of artificial intelligence challenges in game design and the need for giving the player rest time between challenges.
33.02 Evaluate the impact of randomness in game design especially as it pertains to pattern recognition.
33.03 Identify techniques used in the industry to help the player to navigate.
33.04 Explain the use of “just barely” victories as an exciting and immersive technique.
33.05 Assess techniques used to provide a range of challenges and appeal to a wide range of abilities.
33.06 Describe the psychological cost of failure in games as it pertains to immersion and psychological effect.

33.07 Identify methods of preparing the player for greater challenge while allowing for plot development as the story serves the game.

Rules of Play

34.0 Understand the process of creating and designing player actions. – The student will be able to:

34.01 Discuss the principles of player-centric design.
34.02 Research and correlate game complexity level to appropriate age group such that content matches user skill set required.
34.03 Examine and discuss design elements that encourage continuous active engagement both mental and physical.
34.04 Analyze design elements that maintain player interest and vary the degree of challenge.
34.05 Discuss the need for a balance of design elements for the purpose of rewarding and frustrating players.

35.0 Create and design the game flow as it relates to story and plot. – The student will be able to:

35.01 Identify techniques of introducing the story plot and beginning play.
35.02 Describe story plot development techniques for the middle of play in game design.
35.03 Analyze and discuss planning techniques for climax and finale of games.

36.0 Assess common principles and procedures in game flow design. – The student will be able to:

36.01 Assess missions and scenarios game flow techniques.
36.02 Describe common use of mission design and campaigns.
36.03 Evaluate usage of static versus dynamic campaigns.

37.0 Describe rule creation elements of player challenge. – The student will be able to:

37.01 Research common design methods for clearing obstacles or series of obstacles.
37.02 Describe common design elements introducing skill, luck and combinations including escalating challenges to games.
37.03 Identify common design elements used to vary weapons, characters and tools.
37.04 Discuss the incorporation of risk reward and adaptive challenges (AI).
37.05 Evaluate industry use of boss encounters in games.
37.06 Analyze and discuss design considerations from the perspective of other players and multi-player environments.

Game Development Tools

38.0 Identify tools and software commonly used in game development. – The student will be able to:

38.01 Identify and discuss the popular game development tools currently used in the industry.

38.02 Identify and discuss popular gaming engines.
38.03 Identify and discuss popular world building tools.

Music, Sound, Art & Animation

39.0 Understand the methodologies for integrating digital media into a game or simulation. – The student will be able to:

39.01 Survey and discuss the use of naming conventions and temp sounds.
39.02 Analyze and discuss methods of matching sound effects to art assets.
39.03 Identify and categorize commonly used technology sound engine integration equipment.
39.04 Identify and discuss resources such as sound effects libraries.
39.05 Examine methods of sound implementation and associated software.
39.06 Describe how and why digital video may be integrated into a game or simulation design.
39.07 Describe how special effects differ from animation.

40.0 Identify commonly used art and animation production tools in the game design industry. – The student will be able to:

40.01 Identify, categorize and discuss art and animation tools commonly used in game design.

Environmental Design

41.0 Understand the general concepts of environmental design. – The student will be able to:

41.01 Survey and evaluate commonly used concept art.
41.02 Create a world sketch with particular attention to maintaining continuity of style.
41.03 Describe the emotional/psychological aspects of environmental design that signify mood, façade of freedom, and resource struggling.

42.0 Describe how environmental design is used in conjunction with game level design. – The student will be able to:

42.01 Examine and evaluate examples of focus on a theme.
42.02 Describe methods of creating a purposeful architecture giving consideration to continuity and themes and taking advantage of revisiting.
42.03 Consider and discuss environmental design elements for multi-player or single player games.
42.04 Describe the history of creating shifts in game design environments and embracing novel ideas.
42.05 Identify and discuss environmental design pitfalls such as red herrings and cookie-cutter layouts.

Event Modeling in Game Design

43.0 Define the meaning of simulation and pertinent issues facing game designers. – The student will be able to:

43.01 Discuss the meaning of simulation and give examples of simulation and complexity including architecture, exposure, concealment and heuristics.
43.02 Describe applied event modeling including goal discovery, map making, event exploration, developing incentives and learning in event modeling for games.
43.03 Explain the concepts of modes of understanding, inductive and iconic logic, significance and saturation in event modeling for game design.

44.0 Describe applied event modeling as it relates to game design. – The student will be able to:

44.01 Discuss the process of specifying events including contexts of simulation, translating event models to simulations, formalizing thematic objectives, prototyping, interface design and use cases with modeling.
44.02 Describe the design of an application framework including extensible frameworks, software design, configuration, encapsulation, windows and message loops.
44.03 Describe the implementation of an application framework including adding graphics, GUI events and controls, and creating a console.
44.04 Discuss the process of designing entities including behavior and entity graphics.
44.05 Describe the implementation of entities including enumerating animations, playing with time, creating events, adding an entity class, and creating entity events and behaviors.
44.06 Analyze event modeling in creating a world including the creation of a world class, adding and removing entities, accessing entities, updating and rendering, adding scene hierarchies and handling world events.
44.07 Assess and discuss AI and physics issues for simulation including AI event contexts, adding intelligence and gravity, adding collision detection, updating for collisions and applying mass and force.
44.08 Discuss environmental elements of simulation including logic, cognitive saturation, systems and interpretation, context of reality, shadows and lighting.
44.09 Discuss the simulation of physical systems such as trees and forests and related events such as fires, or insect swarms such as beehives, bird flocks or anthills.
44.10 Describe the simulation of social and economic systems including practical applications, historical precedents, modeling for community events, creation of communities including structures, states events and rendering and altering building states, population behaviors, and controlling influences.
44.11 Describe the process of testing simulations and event models including effectiveness, diagrammatic systems evaluation, context influence, path transitions and assessing messages.

Interface Design

45.0 Understand basic HCI principles. – The student will be able to:

45.01 Define and give examples of how HCI principles are considered in designing a game or simulation.
45.02 Describe how client user background, education, goals, motivation, training, culture, age, gender, physical abilities and client sophistication affect interface design.

46.0 Discuss the eight golden rules of HCI. – The student will be able to:

46.01 Discuss the need for functional consistency, shortcuts, feedback, closure, error prevention, easy reversal of actions, feeling in control, and avoiding memory overload.
46.02 Identify game design enhancements that could make better use of HCI Principles.

47.0 Understand the use of inventory systems in game design. – The student will be able to:

47.01 Discuss the various methods of describing items in player's inventory in contemporary game design.
47.02 Review and discuss industry methods of communicating how inventory items can have an effect on game play.

67.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

67.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
67.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
67.03 Present information formally and informally for specific purposes and audiences. AF2.9

68.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

68.01 Demonstrate knowledge of arithmetic operations. AF3.2
68.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
68.03 Construct charts/tables/graphs using functions and data. AF3.5

69.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

69.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
69.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

70.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

70.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
70.02 Locate, organize and reference written information from various sources. CM 3.0
70.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
70.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
70.05 Apply active listening skills to obtain and clarify information. CM 7.0
70.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
70.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

71.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

71.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
71.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
71.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
71.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

72.0 Use information technology tools. – The student will be able to:

72.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
72.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
72.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
72.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

73.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

73.01 Describe the nature and types of business organizations. SY 1.0
73.02 Explain the effect of key organizational systems on performance and quality.
73.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
73.04 Explain the impact of the global economy on business organizations.

76.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

76.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
76.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
76.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
76.04 Interpret and explain written organizational policies and procedures. ELR 2.0

Course Number: DIG0073
Occupational Completion Point – B
Digital Media Artist – 150 Hours – SOC Code 27-1014

48.0 Understand the history of audio/sound effects in the entertainment industry. – The student will be able to:

48.01 Discuss the role of sound in a visual presentation.
48.02 Describe how audio/sound effects can establish or reinforce the mood.
48.03 Explain the importance of production value.
48.04 Describe the evolution of audio/sound effects production.
48.05 Identify the technology incorporated into the production of sound.

49.0 Perform various job roles typical for an audio technician on a game/ simulation project. – The student will be able to:

- 49.01 Identify the job titles of audio technicians and artists typically involved in a game project.
- 49.02 Work as part of a sound design team.
- 49.03 Perform the role of the sound designer for a game/simulation project.
- 49.04 Perform the role of music supervisor for a game/simulation project.
- 49.05 Perform the role of Foley artist for a game/simulation project.
- 49.06 Perform the role of voice actor for a game/simulation project.
- 49.07 Perform the role of recording engineer for a game/simulation project.
- 49.08 Perform the role of sound editor for a game/simulation project.
- 49.09 Perform the role of composer/arranger for a game/simulation project.

50.0 Understand intellectual property rights, copyright laws, and plagiarism as they apply to creative assets. – The student will be able to:

- 50.01 Compare and contrast the doctrines of fair use and fair dealing.
- 50.02 Describe the transfer and licensing of creative works.
- 50.03 Explain the use of “exclusive rights” to intellectual creations.
- 50.04 Use digital watermarking to embed copyright information in an audio file.

51.0 Demonstrate a knowledge of production writing as it relates to game and simulation design. – The student will be able to:

- 51.01 Explain the job of a scriptwriter and outline the elements of a script.
- 51.02 Breakdown a script into audio production elements.
- 51.03 Write simple dialog.
- 51.04 Translate script elements into lyrics for a theme song.
- 51.05 Write narration or instructions for game/simulation.

52.0 Demonstrate appropriate voice acting skills. – The student will be able to:

- 52.01 Read aloud in a professional manner.
- 52.02 Receive and properly act upon direction given by the producer/director.
- 52.03 Understand the concept of voice acting and playing a role while speaking.
- 52.04 Perform various voice acting assignments in a professional manner according to industry standards.

53.0 Demonstrate basic audio production. – The student will be able to:

- 53.01 Describe digital audio storage concepts and digital storage media.
- 53.02 Operate digital recording decks and other digital storage devices.
- 53.03 Describe the function and operation of digital audio workstations.
- 53.04 Edit, cut, erase, and insert sound utilizing various digital production techniques.
- 53.05 Perform digital noise reduction and noise extraction via spectral display.

54.0 Set-up and configure a computer for audio applications. – The student will be able to:

- 54.01 Install basic peripheral devices related to audio programs.

54.02 Install and configure software related to audio programs.
54.03 Demonstrate basic knowledge of computer system requirements.
54.04 Install plug-ins or additional audio source material such as beats and or samples.
54.05 Diagram the signal flow of a digital audio workstation.

55.0 Operate an audio workstation. – The student will be able to:

55.01 Demonstrate knowledge of the digital audio workstation interface.
55.02 Create and arrange a multi-track project.
55.03 Create interest and effect using editing techniques
55.04 Design and edit audio using a waveform editor.
55.05 Record audio directly to the digital audio workstation.
55.06 Mix audio.
55.07 Demonstrate skill in using audio effects and plug-ins.
55.08 Prepare an audio project for finishing and final mix down.
55.09 Transfer audio files between various audio software applications.
55.10 Demonstrate the understanding of audio file bit depth, bandwidth and dithering and be able to explain when and where these apply in various applications of digital audio production.
55.11 Export finished audio.

56.0 Demonstrate application of MIDI in a game/simulation project. – The student will be able to:

56.01 Demonstrate an understanding of MIDI.
56.02 Discuss the advantage and use of MIDI in a game/simulation.
56.03 Discuss the limitations of MIDI.
56.04 Utilize a computer and multiple MIDI instruments.
56.05 Record a single sound track; add multiple sound tracks, and change MIDI voices using the software.
56.06 Export a MIDI soundtrack for use in a game/simulation
56.07 Export a MIDI sound effect for use in a game/simulation
56.08 Apply MIDI file to an object or game/simulation element.

57.0 Incorporate audio assets into game/simulation engine. – The student will be able to:

57.01 Describe the audio effects workflow.
57.02 Explain audio codecs and formats used in game/simulation engines.
57.03 Import audio into the game/simulation engine
57.04 Use appropriate naming conventions for audio assets.
57.05 Describe the use of 3D and surround sound.
57.06 Apply knowledge of distance/spatial effects including surround sound in a game/simulation.
57.07 Contrast the audio environment as it relates to the visual environment.

74.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

74.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0

74.02 Explain emergency procedures to follow in response to workplace accidents.
74.03 Create a disaster and/or emergency response plan. SHE 2.0

75.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

75.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
75.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
75.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
75.04 Employ mentoring skills to inspire and teach others. LT 5.0

77.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

77.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
77.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
77.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
77.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
77.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
77.06 Identify and exhibit traits for retaining employment. ECD 7.0
77.07 Identify opportunities and research requirements for career advancement. ECD 8.0
77.08 Research the benefits of ongoing professional development. ECD 9.0
77.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

78.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

78.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
78.02 Describe the effect of money management on personal and career goals. FL 3.0
78.03 Develop a personal budget and financial goals. FL3.1
78.04 Complete financial instruments for making deposits and withdrawals. FL3.2
78.05 Maintain financial records. FL3.3
78.06 Read and reconcile financial statements. FL3.4
78.07 Research, compare and contrast investment opportunities.

Course Number: DIG0074
Occupational Completion Point – C
Digital Media Specialist – 150 Hours – SOC Code 27-1014

58.0 Understand the history of video effects in the entertainment. – The student will be able to:

58.01 Understand the role of video in a visual presentation.
58.02 Understand how video effects can establish or reinforce the mood.
58.03 Understand the importance of production value.
58.04 Understand the history of video effects production.

58.05 Understand the technology incorporated into the production video and video effects.

59.0 Understand the various job titles and responsibilities video technician as it relates to game and simulation design. – The student will be able to:

59.01 Identify the job titles of video technicians and artist game project.
59.02 Demonstrate the ability to work as part of a video production team.
59.03 Perform the role of the video technical director for a game/simulation project.
59.04 Perform the role of video editor for a game/simulation project.
59.05 Perform the role of camera operator for a game/simulation project.
59.06 Perform the role of special effects coordinator for a game/simulation project.
59.07 Perform the role of video recording operator for a game/simulation project.
59.08 Perform the role of video effects artist for a game/simulation project.
59.09 Perform the role of compositor for a game/simulation project.

60.0 Understand intellectual property rights, copyright laws and plagiarism as it applies to creative assets. – The student will be able to:

60.01 Understand the use of “Fair use and Fair Dealing”.
60.02 Understand the transfer and licensing of creative works.
60.03 Understand the use of “exclusive rights” to intellectual creations.
60.04 Demonstrate the use of digital watermarking.

61.0 Demonstrate a knowledge of production writing as it relates to game and simulation design. – The student will be able to:

61.01 Explain the job of a scriptwriter and outline the elements of a script.
61.02 Demonstrate ability to breakdown a script into video production elements.
61.03 Demonstrate ability to write simple dialog.
61.04 Demonstrate ability to translate script elements into production schedule.
61.05 Demonstrate ability to write narration or instructions for game/simulation.

62.0 Demonstrate appropriate acting skills. – The student will be able to:

62.01 Demonstrate the ability to read aloud in a professional manner.
62.02 Demonstrate the ability to receive and properly act upon direction given by the producer/director.
62.03 Understand the concept of acting and playing a role while speaking.
62.04 Perform the various assignments in a professional manner according to industry standards.

63.0 Demonstrate basic video production. – The student will be able to:

63.01 Use current industry standard production video equipment.
63.02 Operate camera in studio and location (field) production environments.
63.03 Demonstrate understanding of digital video storage concepts and digital storage media.
63.04 Demonstrate knowledge of and the ability to operate digital recording decks, and other digital storage devices.
63.05 Identify and select microphones for production needs.

63.06 Determine appropriate lighting needs for production settings.
63.07 Identify location and studio lighting types, method of use and application.

64.0 Demonstrate set-up and configuration of a computer for video applications. – The student will be able to:

64.01 Install basic peripheral devices related to video programs.
64.02 Install and configure software related to video programs.
64.03 Demonstrate basic knowledge of computer system requirements.
64.04 Demonstrate basic knowledge of installing plug-ins or additional audio source material such as beats and or samples.
64.05 Understand the signal flow of a digital video workstation.

65.0 Demonstrate the basic operation of a video workstation. – The student will be able to:

65.01 Demonstrate knowledge of the digital video workstation interface.
65.02 Demonstrate a working familiarity and understanding of the function and operation of digital video workstations.
65.03 Demonstrate ability to edit, cut, erase, and insert video utilizing various digital production techniques.
65.04 Record video directly to the digital video workstation.
65.05 Demonstrate knowledge of editing video according to message.
65.06 Demonstrate skill in using video effects and plug-ins.
65.07 Prepare a video project for final compositing and export.
65.08 Transfer video files between various video software applications.
65.09 Export finished video.

66.0 Incorporate video assets into game/simulation engine. – The student will be able to:

66.01 Demonstrate knowledge of the video effects workflow.
66.02 Demonstrate knowledge of video codecs and formats used in game/simulation engines.
66.03 Demonstrate knowledge and ability to import video into the game/simulation engine
66.04 Use appropriate naming conventions for video assets.
66.05 Understand the use of placing video assets into a 3D environment.
66.06 Demonstrate knowledge of distance/spatial video effects in relation to sound effects in a game/simulation.
66.07 Understand the audio environment as it relates to the visual environment.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Game & Simulation Foundations**
Course Number: **8208110**
Course Credit: **1**

Course Description:

This course is designed to provide an introduction to game and simulation concepts and careers, the impact game and simulation has on society and industry, and basic game/simulation design concepts such as rule design, play mechanics, and media integration. This course compares and contrasts games and simulations, key development methodologies and tools, careers, and industry-related information. This course also covers strategies, processes, and methods for conceptualizing a game or simulation application; storyboarding techniques; and development tools.

Hands-on activities using an entry-level game development tool such as Game Maker or Alice should be integrated into the curriculum. Regardless of topic sequencing, the culminating activity is the creation of a playable game.

Game & Simulation Creation

Instruction relating to the standards in this section should be interspersed throughout the entire course with the other standards taught progressively in the context of game design and development.

01.0 Create a game design production plan that describes the game play, outcomes, controls, interface and artistic style of a video game. – The student will be able to:

- 01.01 Use industry standard game design production documents to create a game design production plan.

02.0 Design and create a playable game. – The student will be able to:

- 02.01 Use a number of computer tools to enhance and ease game programming and artistry.
- 02.02 Use a game engine to create a playable game.
- 02.03 Use animated objects.
- 02.04 Program sound and music to enhance the game experience.
- 02.05 Test and debug the completed game.

Critical Game & Simulation Studies

03.0 Categorize the different gaming genres. – The student will be able to:

- 03.01 Research, compare and categorize the different gaming genres.
- 03.02 Analyze examples of different gaming genres.

03.03 Define and use the necessary vocabulary related to gaming and the different genres.

04.0 Categorize different gaming systems. – The student will be able to:

04.01 Research, compare and categorize different gaming systems.
04.02 Analyze the distinctive features of each system.
04.03 Define the target audience for different systems based on features, available games, and price of system and games.
04.04 Define and use the necessary vocabulary related to gaming hardware.

05.0 Understand the historical significance of electronic and non-electronic games. – The student will be able to:

05.01 Discuss the history of non-electronic games.
05.02 Describe the history and theory of mainstream and experimental media including radio, movies, television, art, and theatre.
05.03 Explain the historical timeline of electronic games, marking the significant highlights in their evolution.

06.0 Describe the trends in current and next-generation game development. – The student will be able to:

06.01 Determine and analyze the significant trends in game development in the past two decades.
06.02 Research and brainstorm the possibilities for the next generation of electronic games based on current and emerging technologies and future predictions.

Societal Impact

07.0 Understand the role of play in human culture. – The student will be able to:

07.01 Discuss the word “play” and its many definitions.
07.02 Discuss the effect of play on today’s culture, specifically why it is important and what it provides in terms of balance in our lives.
07.03 Describe the history of play and its importance in developing societies and cultures.
07.04 Investigate and discuss how play can help humans, particularly children, acquire knowledge.
07.05 Describe the benefits of role-playing games and simulations, including online economies and community-building.

08.0 Understand the psychological impact of games on individuals and groups. – The student will be able to:

08.01 Investigate studies that discuss the impact of violent games on children and adults.
08.02 Compare and contrast the different opinions on the effects of games on behavior, cognitive development, and motor skills.
08.03 Research and discuss differing opinions on video game addiction and what would define addiction.

08.04 Examine online digital worlds such as Second Life and the impact these worlds have on individuals and groups.

Management & Industry

09.0 Understand the business model commonly used in the game development industry. – The student will be able to:

09.01 Identify, define and discuss the different ways games are funded, marketed and sold.
09.02 Identify and describe licensing management for different gaming platforms.
09.03 Discuss the product value and business differences between major game platforms.
09.04 Identify successful business models and analyze various facets of those models, such as market analysis, marketing strategy, and product value.

10.0 Examine and categorize the significant processes in the production of interactive games. – The student will be able to:

10.01 Discuss the relationships between publishers, developers, distributors, marketers, and retailers.
10.02 Identify processes of development including content creation, team roles, design documentation, and process management.
10.03 Explore and describe the effects of globalization on the design and production of video games.

11.0 Understand the core tasks and challenges that face a video game design team. – The student will be able to:

11.01 Identify and define the roles and responsibilities of team members on a video game design team.
11.02 Describe the effects of group dynamics and the importance of team building for a design team.
11.03 Explore and discuss methods of communications and scheduling for design teams.
11.04 Describe the importance and interrelationship between development schedule and budget constraints in video game design.

12.0 Understand legal issues that affect games, developers and players. – The student will be able to:

12.01 Define and discuss intellectual property and contract law as it relates to the gaming industry.
12.02 Describe legal and liability issues that could affect online communities.
12.03 Compare and contrast government and industry content regulation and industry ratings of video games.

13.0 Describe the impact of the video game industry on the economy. – The student will be able to:

13.01 Explore and discuss the impact of video games on the economy including domestic sales, foreign exports, and video game rentals.
13.02 Research and describe the effect of game software in driving new technologies and the purchases of video game hardware, gaming PCs, and complementary technologies such as high-definition televisions.
13.03 Analyze the technological transfers from video games to other industries, such as education, medical, corporate training, and military simulation technologies that were developed by the video game industry, as well as 3D "gaming" graphics cards that have found use for other applications.
13.04 Describe how frequent exposure and/or access to video games has reshaped the level of technical proficiency of our work force.

Job Readiness & Career Development

14.0 Demonstrate the professional level of written and oral communication required in the game development industry. – The student will be able to:

14.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
14.02 Organize ideas and communicate oral and written messages appropriate for the game development industry environment
14.03 Identify, define, and discuss terminology appropriate for both internal and external communications in the game development industry environment.

15.0 Demonstrate human relations/interpersonal skills for the workplace. – The student will be able to:

15.01 Solicit and accept constructive criticism.
15.02 Demonstrate personal and interpersonal skills appropriate for the workplace such as responsibility, dependability, punctuality, positive attitude, initiative, respect for self and others, and professional dress.
15.03 Collaborate with individuals and teams to complete tasks and solve problems.

16.0 Investigate career opportunities in the game industry. – The student will be able to:

16.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
16.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.
16.03 Describe job requirements for a variety of occupations within the game development industry.

Game & Simulation Analysis

17.0 Demonstrate an understanding of the vocabulary for discussing games and play. – The student will be able to:

17.01 Identify, define, and discuss professional game design and analysis terminology appropriate for internal and external communications in a game design environment.

17.02 Identify and define the vocabulary used by game players and online gaming communities.

18.0 Demonstrate an understanding of the techniques used to evaluate game mechanics, game play, flow and game design. – The student will be able to:

18.01 Test and analyze games to determine the quality of rules, interfaces, navigation, performance, play, artistry and longevity in design and structure.
18.02 Research and evaluate the game analysis techniques used by the video game industry.
18.03 Identify the key elements in a game and make intelligent judgments about whether the game succeeded or failed in its objectives.
18.04 Evaluate professional reviews and write a critical analysis of a current video game.

19.0 Describe the complex interaction between video games and players and the role it plays in the popularity of a game. – The student will be able to:

19.01 Analyze and deconstruct game environments and interactions.
19.02 Compare and contrast the top selling video games in terms of player interaction, plot complexity, and reward.

Game & Simulation Design

20.0 Understand the general procedure and requirements of game design. – The student will be able to:

20.01 Describe the design process from conception to production.
20.02 Discuss the iterative nature of game and simulation design.
20.03 Develop design plans, character sketches, documentation and storyboards for proposed games.

21.0 Explore the methods used to create and sustain player immersion. – The student will be able to:

21.01 Research and define the term “player immersion”.
21.02 Explore and explain the factors that create player immersion in a game.
21.03 Examine popular games and explain the methods each game uses to increase player immersion.

22.0 Become familiar with popular game tools such as DirectX, 3DMAX, and different gaming engines. – The student will be able to:

22.01 Identify and discuss the popular game development tools currently used in the industry.
22.02 Identify and discuss popular gaming engines.
22.03 Research and analyze the uses for different game development tools.

23.0 Demonstrate an understanding of interface design and hardware constraints on video games including processors and I/O devices. – The student will be able to:

23.01 Identify the different control systems for video games.
23.02 Compare and contrast personal computer and video game console hardware.
23.03 Explain the factors that can limit the game playing ability of personal computers.
23.04 Chart the evolution of video game hardware over the past 20 years.

67.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

67.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
67.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
67.03 Present information formally and informally for specific purposes and audiences. AF2.9

68.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

68.01 Demonstrate knowledge of arithmetic operations. AF3.2
68.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
68.03 Construct charts/tables/graphs using functions and data. AF3.5

69.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

69.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
69.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Game & Simulation Design**
Course Number: **8208120**
Course Credit: **1**

Course Description:

This course covers fundamental principles of designing a game or a simulation application, in particular Human Computer Interface (HCI) principles, rules and strategies of play, conditional branching, design and development constraints, use of sound and animation, design tools, and implementation issues. The content includes market research, product design documentation, storyboarding, proposal development, and presentation of a project report. Emphasis is placed on the techniques needed to develop well-documented, structured game or simulation programs. Extensive use is made of evaluating and analyzing existing games or simulations.

Hands-on activities using an entry-level game development tool such as Game Maker or Alice should be integrated into the curriculum. **Regardless of topic sequencing, the culminating activity is the creation and presentation of a playable game with design documentation.**

Game/Simulation Project

Instruction relating to the standards in this section should be interspersed throughout the entire course with the other standards taught progressively in the context of game design and development.

24.0 Create a working game or simulation individually or as part of a team. – The student will be able to:

- 24.01 Create a storyboard describing the essential elements, plot, flow, and functions of the game/simulation.
- 24.02 Create a design specification document to include interface and delivery choices, rules of play, navigation functionality, scoring, media choices, start and end of play, special features, and development team credits.
- 24.03 Using a simple game development tool, create a game or simulation.
- 24.04 Present the game or simulation.

Design Essentials

25.0 Describe the game development life cycle. – The student will be able to:

- 25.01 Identify steps in the pre-production process including the proof of concept and market research.
- 25.02 Describe the iterative prototyping process – Alpha, Beta, RTM.
- 25.03 Determine scripting requirements.
- 25.04 Implement techniques of scenario development, levels, and missions.
- 25.05 Discuss game testing requirements and methods.
- 25.06 Identify and describe maintenance, upgrade and sequel issues.

26.0 Identify hardware constraints on video games including processors and I/O devices. – The student will be able to:

26.01 Identify the different control systems for video games.
26.02 Compare and contrast personal computer and video game console hardware, including display systems.
26.03 Explain the factors that can limit the game-playing ability of personal computers.

27.0 Identify non-hardware development constraints. – The student will be able to:

27.01 Identify and discuss software integration issues relating to scripting, sound, art animation, game engine and world design software integration.
27.02 Describe constraints such as development time, personnel, talent acquisition, financial/budget constraints, and schedule.
27.03 Describe societal and legal constraints affecting game and simulation design.

Game Design Documentation

28.0 Understand the general principles of storytelling. – The student will be able to:

28.01 Identify the essential elements of a story.
28.02 Describe how creative writing is used as a game design tool.
28.03 Compare and contrast methods of delivering a story in a game.

29.0 Understand the use of storyboarding in game design. – The student will be able to:

29.01 Assess the techniques used in the gaming industry for rendering basic Game Design Art.
29.02 Describe how game layout charts are used in game design.
29.03 Describe how storyboards in the game design process can be used as a pre-development sales tool.
29.04 Analyze and compare the use of storyboards in the game design industry with regard to environmental illustrations, level designs, character designs, model sheets and GUI Designs.

30.0 Develop a game design document or blueprint. – The student will be able to:

30.01 Evaluate and discuss the choice of delivery system.
30.02 Evaluate and discuss choices of genre, game design software, art, digital media, and animation software.
30.03 Create a game strategy overview, character overview, and storyboard overview.
30.04 Define the rules of play and multi-player options.
30.05 Create the layout and interfaces overview and digital media overview.
30.06 Determine the event modeling requirements and create the progression levels overview.
30.07 Define strategic positioning of game immersion dynamics and psychological effect.
30.08 Identify hardware and software constraints.

Game Strategy

31.0 Understand strategic outlining in game designs. – The student will be able to:

- 31.01 Assess techniques of goal design in gaming.
- 31.02 Describe the concept of nested victories.
- 31.03 Discuss the use of players as agents of change.
- 31.04 Compare and contrast examples of understandable context in gaming.
- 31.05 Discuss the principles underlying the creation of understandable rules.
- 31.06 Describe how skill building is used in game design.
- 31.07 Describe conventional techniques of positive feedback.
- 31.08 Discuss functional consistency as it relates to the use of interfaces.

32.0 Explore elements of puzzle design. – The student will be able to:

- 32.01 Describe the essential elements of a puzzle.
- 32.02 Identify the different types of puzzles.
- 32.03 Describe the basic principles of high-level puzzle design.
- 32.04 Describe the basic principles of low-level puzzle design.

33.0 Discuss key strategic considerations in game design. – The student will be able to:

- 33.01 Describe the use of artificial intelligence challenges in game design and the need for giving the player rest time between challenges.
- 33.02 Evaluate the impact of randomness in game design especially as it pertains to pattern recognition.
- 33.03 Identify techniques used in the industry to help the player to navigate.
- 33.04 Explain the use of “just barely” victories as an exciting and immersive technique.
- 33.05 Assess techniques used to provide a range of challenges and appeal to a wide range of abilities.
- 33.06 Describe the psychological cost of failure in games as it pertains to immersion and psychological effect.
- 33.07 Identify methods of preparing the player for greater challenge while allowing for plot development as the story serves the game.

Rules of Play

34.0 Understand the process of creating and designing player actions. – The student will be able to:

- 34.01 Discuss the principles of player-centric design.
- 34.02 Research and correlate game complexity level to appropriate age group such that content matches user skill set required.
- 34.03 Examine and discuss design elements that encourage continuous active engagement both mental and physical.
- 34.04 Analyze design elements that maintain player interest and vary the degree of challenge.
- 34.05 Discuss the need for a balance of design elements for the purpose of rewarding and frustrating players.

35.0 Create and design the game flow as it relates to story and plot. – The student will be able to:

35.01 Identify techniques of introducing the story plot and beginning play.
35.02 Describe story plot development techniques for the middle of play in game design.
35.03 Analyze and discuss planning techniques for climax and finale of games.

36.0 Assess common principles and procedures in game flow design. – The student will be able to:

36.01 Assess missions and scenarios game flow techniques.
36.02 Describe common use of mission design and campaigns.
36.03 Evaluate usage of static versus dynamic campaigns.

37.0 Describe rule creation elements of player challenge. – The student will be able to:

37.01 Research common design methods for clearing obstacles or series of obstacles.
37.02 Describe common design elements introducing skill, luck and combinations including escalating challenges to games.
37.03 Identify common design elements used to vary weapons, characters and tools.
37.04 Discuss the incorporation of risk reward and adaptive challenges (AI).
37.05 Evaluate industry use of boss encounters in games.
37.06 Analyze and discuss design considerations from the perspective of other players and multi-player environments.

Game Development Tools

38.0 Identify tools and software commonly used in game development. – The student will be able to:

38.01 Identify and discuss the popular game development tools currently used in the industry.
38.02 Identify and discuss popular gaming engines.
38.03 Identify and discuss popular world building tools.

Music, Sound, Art & Animation

39.0 Understand the methodologies for integrating digital media into a game or simulation. – The student will be able to:

39.01 Survey and discuss the use of naming conventions and temp sounds.
39.02 Analyze and discuss methods of matching sound effects to art assets.
39.03 Identify and categorize commonly used technology sound engine integration equipment.
39.04 Identify and discuss resources such as sound effects libraries.
39.05 Examine methods of sound implementation and associated software.
39.06 Describe how and why digital video may be integrated into a game or simulation design.
39.07 Describe how special effects differ from animation.

40.0 Identify commonly used art and animation production tools in the game design industry. – The student will be able to:

40.01 Identify, categorize and discuss art and animation tools commonly used in game design.

Environmental Design

41.0 Understand the general concepts of environmental design. – The student will be able to:

41.01 Survey and evaluate commonly used concept art.
41.02 Create a world sketch with particular attention to maintaining continuity of style.
41.03 Describe the emotional/psychological aspects of environmental design that signify mood, façade of freedom, and resource struggling.

42.0 Describe how environmental design is used in conjunction with game level design. – The student will be able to:

42.01 Examine and evaluate examples of focus on a theme.
42.02 Describe methods of creating a purposeful architecture giving consideration to continuity and themes and taking advantage of revisiting.
42.03 Consider and discuss environmental design elements for multi-player or single player games.
42.04 Describe the history of creating shifts in game design environments and embracing novel ideas.
42.05 Identify and discuss environmental design pitfalls such as red herrings and cookie-cutter layouts.

Event Modeling in Game Design

43.0 Define the meaning of simulation and pertinent issues facing game designers. – The student will be able to:

43.01 Discuss the meaning of simulation and give examples of simulation and complexity including architecture, exposure, concealment and heuristics.
43.02 Describe applied event modeling including goal discovery, map making, event exploration, developing incentives and learning in event modeling for games.
43.03 Explain the concepts of modes of understanding, inductive and iconic logic, significance and saturation in event modeling for game design.

44.0 Describe applied event modeling as it relates to game design. – The student will be able to:

44.01 Discuss the process of specifying events including contexts of simulation, translating event models to simulations, formalizing thematic objectives, prototyping, interface design and use cases with modeling.
44.02 Describe the design of an application framework including extensible frameworks, software design, configuration, encapsulation, windows and message loops.
44.03 Describe the implementation of an application framework including adding graphics, GUI events and controls, and creating a console.

44.04 Discuss the process of designing entities including behavior and entity graphics.
44.05 Describe the implementation of entities including enumerating animations, playing with time, creating events, adding an entity class, and creating entity events and behaviors.
44.06 Analyze event modeling in creating a world including the creation of a world class, adding and removing entities, accessing entities, updating and rendering, adding scene hierarchies and handling world events.
44.07 Assess and discuss AI and physics issues for simulation including AI event contexts, adding intelligence and gravity, adding collision detection, updating for collisions and applying mass and force.
44.08 Discuss environmental elements of simulation including logic, cognitive saturation, systems and interpretation, context of reality, shadows and lighting.
44.09 Discuss the simulation of physical systems such as trees and forests and related events such as fires, or insect swarms such as beehives, bird flocks or anthills.
44.10 Describe the simulation of social and economic systems including practical applications, historical precedents, modeling for community events, creation of communities including structures, states events and rendering and altering building states, population behaviors, and controlling influences.
44.11 Describe the process of testing simulations and event models including effectiveness, diagrammatic systems evaluation, context influence, path transitions and assessing messages.

Interface Design

45.0 Understand basic HCI principles. – The student will be able to:

45.01 Define and give examples of how HCI principles are considered in designing a game or simulation.
45.02 Describe how client user background, education, goals, motivation, training, culture, age, gender, physical abilities and client sophistication affect interface design.

46.0 Discuss the eight golden rules of HCI. – The student will be able to:

46.01 Discuss the need for functional consistency, shortcuts, feedback, closure, error prevention, easy reversal of actions, feeling in control, and avoiding memory overload.
46.02 Identify game design enhancements that could make better use of HCI Principles.

47.0 Understand the use of inventory systems in game design. – The student will be able to:

47.01 Discuss the various methods of describing items in player's inventory in contemporary game design.
47.02 Review and discuss industry methods of communicating how inventory items can have an effect on game play.

70.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

70.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
70.02 Locate, organize and reference written information from various sources. CM 3.0
70.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
70.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
70.05 Apply active listening skills to obtain and clarify information. CM 7.0
70.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
70.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

71.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

71.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
71.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
71.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
71.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

72.0 Use information technology tools. – The student will be able to:

72.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
72.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
72.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
72.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

73.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

73.01 Describe the nature and types of business organizations. SY 1.0
73.02 Explain the effect of key organizational systems on performance and quality.
73.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
73.04 Explain the impact of the global economy on business organizations.

76.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

76.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
76.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
76.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
76.04 Interpret and explain written organizational policies and procedures. ELR 2.0

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Game & Simulation Audio/Sound Effects**
Course Number: **8208230**
Course Credit: **1**

Course Description:

This course is focused on students acquiring skills in designing, producing, editing, and integrating audio and sound effects into a game or simulation application.

48.0 Understand the history of audio/sound effects in the entertainment industry. – The student will be able to:

- 48.01 Discuss the role of sound in a visual presentation.
- 48.02 Describe how audio/sound effects can establish or reinforce the mood.
- 48.03 Explain the importance of production value.
- 48.04 Describe the evolution of audio/sound effects production.
- 48.05 Identify the technology incorporated into the production of sound.

49.0 Perform various job roles typical for an audio technician on a game/ simulation project. – The student will be able to:

- 49.01 Identify the job titles of audio technicians and artists typically involved in a game project.
- 49.02 Work as part of a sound design team.
- 49.03 Perform the role of the sound designer for a game/simulation project.
- 49.04 Perform the role of music supervisor for a game/simulation project.
- 49.05 Perform the role of Foley artist for a game/simulation project.
- 49.06 Perform the role of voice actor for a game/simulation project.
- 49.07 Perform the role of recording engineer for a game/simulation project.
- 49.08 Perform the role of sound editor for a game/simulation project.
- 49.09 Perform the role of composer/arranger for a game/simulation project.

50.0 Understand intellectual property rights, copyright laws, and plagiarism as they apply to creative assets. – The student will be able to:

- 50.01 Compare and contrast the doctrines of fair use and fair dealing.
- 50.02 Describe the transfer and licensing of creative works.
- 50.03 Explain the use of “exclusive rights” to intellectual creations.
- 50.04 Use digital watermarking to embed copyright information in an audio file.

51.0 Demonstrate a knowledge of production writing as it relates to game and simulation design. – The student will be able to:

- 51.01 Explain the job of a scriptwriter and outline the elements of a script.
- 51.02 Breakdown a script into audio production elements.
- 51.03 Write simple dialog.
- 51.04 Translate script elements into lyrics for a theme song.

51.05 Write narration or instructions for game/simulation.

52.0 Demonstrate appropriate voice acting skills. – The student will be able to:

52.01 Read aloud in a professional manner.
52.02 Receive and properly act upon direction given by the producer/director.
52.03 Understand the concept of voice acting and playing a role while speaking.
52.04 Perform various voice acting assignments in a professional manner according to industry standards.

53.0 Demonstrate basic audio production. – The student will be able to:

53.01 Describe digital audio storage concepts and digital storage media.
53.02 Operate digital recording decks and other digital storage devices.
53.03 Describe the function and operation of digital audio workstations.
53.04 Edit, cut, erase, and insert sound utilizing various digital production techniques.
53.05 Perform digital noise reduction and noise extraction via spectral display.

54.0 Set-up and configure a computer for audio applications. – The student will be able to:

54.01 Install basic peripheral devices related to audio programs.
54.02 Install and configure software related to audio programs.
54.03 Demonstrate basic knowledge of computer system requirements.
54.04 Install plug-ins or additional audio source material such as beats and or samples.
54.05 Diagram the signal flow of a digital audio workstation.

55.0 Operate an audio workstation. – The student will be able to:

55.01 Demonstrate knowledge of the digital audio workstation interface.
55.02 Create and arrange a multi-track project.
55.03 Create interest and effect using editing techniques
55.04 Design and edit audio using a waveform editor.
55.05 Record audio directly to the digital audio workstation.
55.06 Mix audio.
55.07 Demonstrate skill in using audio effects and plug-ins.
55.08 Prepare an audio project for finishing and final mix down.
55.09 Transfer audio files between various audio software applications.
55.10 Demonstrate the understanding of audio file bit depth, bandwidth and dithering and be able to explain when and where these apply in various applications of digital audio production.
55.11 Export finished audio.

56.0 Demonstrate application of MIDI in a game/simulation project. – The student will be able to:

56.01 Demonstrate an understanding of MIDI.
56.02 Discuss the advantage and use of MIDI in a game/simulation.
56.03 Discuss the limitations of MIDI.
56.04 Utilize a computer and multiple MIDI instruments.
56.05 Record a single sound track; add multiple sound tracks, and change MIDI voices using the software.

56.06 Export a MIDI soundtrack for use in a game/simulation
56.07 Export a MIDI sound effect for use in a game/simulation
56.08 Apply MIDI file to an object or game/simulation element.

57.0 Incorporate audio assets into game/simulation engine. – The student will be able to:

57.01 Describe the audio effects workflow.
57.02 Explain audio codecs and formats used in game/simulation engines.
57.03 Import audio into the game/simulation engine
57.04 Use appropriate naming conventions for audio assets.
57.05 Describe the use of 3D and surround sound.
57.06 Apply knowledge of distance/spatial effects including surround sound in a game/simulation.
57.07 Contrast the audio environment as it relates to the visual environment.

74.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

74.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
74.02 Explain emergency procedures to follow in response to workplace accidents.
74.03 Create a disaster and/or emergency response plan. SHE 2.0

75.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

75.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
75.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
75.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
75.04 Employ mentoring skills to inspire and teach others. LT 5.0

77.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

77.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
77.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
77.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
77.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
77.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
77.06 Identify and exhibit traits for retaining employment. ECD 7.0
77.07 Identify opportunities and research requirements for career advancement. ECD 8.0
77.08 Research the benefits of ongoing professional development. ECD 9.0
77.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

78.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

78.01	Identify and describe the services and legal responsibilities of financial institutions.	FL 2.0
78.02	Describe the effect of money management on personal and career goals.	FL 3.0
78.03	Develop a personal budget and financial goals.	FL3.1
78.04	Complete financial instruments for making deposits and withdrawals.	FL3.2
78.05	Maintain financial records.	FL3.3
78.06	Read and reconcile financial statements.	FL3.4
78.07	Research, compare and contrast investment opportunities.	

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Game & Simulation Video/Special Effects**
Course Number: **82082400**
Course Credit: **1**

Course Description:

This course is focused on students acquiring skills in designing, producing, editing, and integrating video and special effects into a game or simulation application.

58.0 Understand the history of video effects in the entertainment. – The student will be able to:

- 58.01 Understand the role of video in a visual presentation.
- 58.02 Understand how video effects can establish or reinforce the mood.
- 58.03 Understand the importance of production value.
- 58.04 Understand the history of video effects production.
- 58.05 Understand the technology incorporated into the production video and video effects.

59.0 Understand the various job titles and responsibilities video technician as it relates to game and simulation design. – The student will be able to:

- 59.01 Identify the job titles of video technicians and artist game project.
- 59.02 Demonstrate the ability to work as part of a video production team.
- 59.03 Perform the role of the video technical director for a game/simulation project.
- 59.04 Perform the role of video editor for a game/simulation project.
- 59.05 Perform the role of camera operator for a game/simulation project.
- 59.06 Perform the role of special effects coordinator for a game/simulation project.
- 59.07 Perform the role of video recording operator for a game/simulation project.
- 59.08 Perform the role of video effects artist for a game/simulation project.
- 59.09 Perform the role of compositor for a game/simulation project.

60.0 Understand intellectual property rights, copyright laws and plagiarism as it applies to creative assets. – The student will be able to:

- 60.01 Understand the use of “Fair use and Fair Dealing”.
- 60.02 Understand the transfer and licensing of creative works.
- 60.03 Understand the use of “exclusive rights” to intellectual creations.
- 60.04 Demonstrate the use of digital watermarking.

61.0 Demonstrate a knowledge of production writing as it relates to game and simulation design-The student will be able to:

- 61.01 Explain the job of a scriptwriter and outline the elements of a script.
- 61.02 Demonstrate ability to breakdown a script into video production elements.
- 61.03 Demonstrate ability to write simple dialog.

61.04 Demonstrate ability to translate script elements into production schedule.
61.05 Demonstrate ability to write narration or instructions for game/simulation.

62.0 Demonstrate appropriate acting skills. – The student will be able to:

62.01 Demonstrate the ability to read aloud in a professional manner.
62.02 Demonstrate the ability to receive and properly act upon direction given by the producer/director.
62.03 Understand the concept of acting and playing a role while speaking.
62.04 Perform the various assignments in a professional manner according to industry standards.

63.0 Demonstrate basic video production. – The student will be able to:

63.01 Use current industry standard production video equipment.
63.02 Operate camera in studio and location (field) production environments.
63.03 Demonstrate understanding of digital video storage concepts and digital storage media.
63.04 Demonstrate knowledge of and the ability to operate digital recording decks, and other digital storage devices.
63.05 Identify and select microphones for production needs.
63.06 Determine appropriate lighting needs for production settings.
63.07 Identify location and studio lighting types, method of use and application.

64.0 Demonstrate set-up and configuration of a computer for video applications. – The student will be able to:

64.01 Install basic peripheral devices related to video programs.
64.02 Install and configure software related to video programs.
64.03 Demonstrate basic knowledge of computer system requirements.
64.04 Demonstrate basic knowledge of installing plug-ins or additional audio source material such as beats and or samples.
64.05 Understand the signal flow of a digital video workstation.

65.0 Demonstrate the basic operation of an video workstation. – The student will be able to:
65.01 Demonstrate knowledge of the digital video workstation interface.
65.02 Demonstrate a working familiarity and understanding of the function and operation of digital video workstations.
65.03 Demonstrate ability to edit, cut, erase, and insert video utilizing various digital production techniques.
65.04 Record video directly to the digital video workstation.
65.05 Demonstrate knowledge of editing video according to message.
65.06 Demonstrate skill in using video effects and plug-ins.
65.07 Prepare a video project for final compositing and export.
65.08 Transfer video files between various video software applications.
65.09 Export finished video.

66.0 Incorporate video assets into game/simulation engine. – The student will be able to:

66.01 Demonstrate knowledge of the video effects workflow.

66.02 Demonstrate knowledge of video codecs and formats used in game/simulation engines.
66.03 Demonstrate knowledge and ability to import video into the game/simulation engine
66.04 Use appropriate naming conventions for video assets.
66.05 Understand the use of placing video assets into a 3D environment.
66.06 Demonstrate knowledge of distance/spatial video effects in relation to sound effects in a game/simulation.
66.07 Understand the audio environment as it relates to the visual environment.

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Florida Department of Education
Curriculum Framework

Program Title: **Game/Simulation/Animation Programming**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	8208300	B082300
CIP Number	0507.039916	0507.039916
Grade Level	9-12, 30, 31	30, 31
Standard Length	4 credits	600 hours
Teacher Certification	BUS ED 1 @2 COMPU SCI 6 COMM ART @7 G TV PRO TEC @7 G	BUS ED 1 @2 COMPU SCI 6 COMM ART @7 G TV PRO TEC @7 G
CTSO	FBLA BPA	Phi Beta Lambda BPA
SOC Codes (all applicable)	15-1099.13; 15-1021	15-1099.13; 15-1021
Facility Code	212 http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	Mathematics: 10.0 Language: 10.0 Reading: 10.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as a Game/Simulation Designer, Game Programmer, and Game Software Developer in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to practical experiences in game/simulation conceptualization, design, storyboarding, development methodologies, essential programming techniques, and implementation issues. Specialized programming skills involving advanced mathematical calculations and physics are also integrated into the curriculum.

Program Structure

This program is a planned sequence of instruction consisting of three occupational completion points. Students enrolling in this program must be computer literate. This literacy can be achieved by completing one credit of the Business Technology Education core. This includes Computing for College & Careers (8209020) or Introduction to Information Technology (8207310). It is also recommended that students complete core courses in advanced mathematics and physics. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or exit as an occupational completer.

When offered at the post secondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	DIG0070	Game/Simulation Designer	300	15-1099.13
B	DIG0075	Game/Simulation Programmer	150	15-1021
C	DIG0076	Game/Simulation Software Developer	150	15-1021

** Note: OTA0040 is a highly recommended core program.*

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8208110 8208120	Game & Simulation Foundations Game & Simulation Design	1 credit 1 credit	27-1021	2
B	8208330	Game & Simulation Programming	1 credit	15-1021	2
C	8208340	Multi-User Game & Simulation Programming	1 credit	15-1041	2

** Note: It is highly recommended that students complete the BTE Core, either Computing for College and Careers (8209020) or Introduction to Information Technology (8207310), prior to or concurrently with the first two courses.*

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Program Recommendations

This program is project-based and focuses on broad, transferable skills and stresses understanding and demonstration of the following rudiments of the game and simulation industry: production planning, elements of production design, storyboarding, elements of visual design, integration of digital audio and digital video into new game/simulation productions, programming for single and multi-user environments, delivery systems, and collaboration/teamwork.

The Foundations and Design courses should be taken in sequence prior to the Programming and Multi-User Programming courses. The Programming and Multi-User Programming courses may be taken concurrently. It is highly recommended that students complete a programming course prior to taking the last two courses of this program. The BTE core course may be taken concurrently with either the Foundations course or the Design course.

The Programming (8208330) and Multiuser Programming (8208340) courses should be offered with a concentration on one programming language to ensure students are prepared for industry certifications.

The Game/Simulation/Animation Advanced Applications program (8208400) is an appropriate follow-on capstone program.

The Game/Simulation/Animation Programming program lends itself to integration of the core academic subjects of language arts, math, science, visual arts, and social studies into project activities. It is through a balanced and integrated curriculum that students attain the attitudes, skills, and knowledge needed to compete successfully in today's work force. To achieve total curriculum integration, academic and career and technical education teachers should be scheduled with common planning times.

This program emphasizes the development of technical abilities as well as ethical and societal awareness necessary to function in a highly technological society. The use of cooperative learning groups is recommended. By learning and practicing group process skills, students will be prepared to work "together" in real work situations. Program graduates will develop enhanced self-esteem as well as the problem solving and teamwork skills necessary to succeed in careers and postsecondary education.

The Game/Simulation/Animation Programming program places a strong emphasis on workplace learning. Job shadowing and mentoring experiences with game and simulation professionals along with on-site trips to local businesses connect classroom learning to the workplace. In-class guest speakers bring the real world into the classroom.

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills to secondary students. For postsecondary students, Phi Beta Lambda and BPA are the appropriate student organizations. Career and Technical Student Organizations provide activities for students as an integral part of the

instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 10.0, Language 10.0, and Reading 10.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if

needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

The PSAV component of this program has no statewide articulation agreement approved by the Articulation Coordinating Committee. However, this does not preclude the awarding of credits by any college through local agreements.

For details on statewide articulation agreements which correlate to programs and industry certifications, refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Create a game design production plan that describes the game play, outcomes, controls, interface and artistic style of a video game.
02.0 Design and create a playable game.
03.0 Categorize the different gaming genres.
04.0 Categorize different gaming systems.
05.0 Understand the historical significance of electronic and non-electronic games.
06.0 Describe the trends in current and next-generation game development.
07.0 Understand the role of play in human culture.
08.0 Understand the psychological impact of games on individuals and groups.
09.0 Understand the business model commonly used in the game development industry.
10.0 Examine and categorize the significant processes in the production of interactive games.
11.0 Understand the core tasks and challenges that face a video game design team.
12.0 Understand legal issues that affect games, developers and players.
13.0 Describe the impact of the video game industry on the economy.
14.0 Demonstrate the professional level of written and oral communication required in the game development industry.
15.0 Demonstrate human relations/interpersonal skills for the workplace.
16.0 Investigate career opportunities in the game industry.
17.0 Demonstrate an understanding of the vocabulary for discussing games and play.
18.0 Demonstrate an understanding of the techniques used to evaluate game mechanics, game play, flow, and game design.
19.0 Describe the complex interaction between video games and players and the role it plays in the popularity of a game.
20.0 Understand the general procedure and requirements of game design.
21.0 Explore the methods used to create and sustain player immersion.
22.0 Become familiar with popular game tools such as DirectX, 3DMax, and different gaming engines.
23.0 Demonstrate an understanding of interface design and hardware constraints on video games including processors and I/O devices.
24.0 Create a working game or simulation individually or as part of a team.
25.0 Describe the game development life cycle.
26.0 Identify hardware constraints on video games including processors and I/O devices.
27.0 Identify non-hardware development constraints.
28.0 Understand the general principles of storytelling.
29.0 Understand the use of storyboarding in game design.
30.0 Develop a game design document or blueprint.
31.0 Understand strategic outlining in game designs.
32.0 Explore elements of puzzle design.
33.0 Discuss key strategic considerations in game design.
34.0 Understand the process of creating and designing player actions.
35.0 Create and design the game flow as it relates to story and plot.
36.0 Assess common principles and procedures in game flow design.
37.0 Describe rule creation elements of player challenge.
38.0 Identify tools and software commonly used in game development.
39.0 Understand the methodologies for integrating digital media into a game or simulation.
40.0 Identify commonly used art and animation production tools in the game design industry.
41.0 Understand the general concepts of environmental design.
42.0 Describe how environmental design is used in conjunction with game level design.
43.0 Define the meaning of simulation and pertinent issues facing game designers.
44.0 Describe applied event modeling as it relates to game design.
45.0 Understand basic HCI principles.

46.0 Discuss the eight golden rules of HCI.
47.0 Understand the use of inventory systems in game design.
48.0 Identify functions of information processing.
49.0 Test programs.
50.0 Plan program design.
51.0 Code programs.
52.0 Perform program maintenance.
53.0 Create and maintain documentation.
54.0 Evaluate assigned game programming tasks.
55.0 Implement enhanced program structures.
56.0 Identify and describe basic network terminology and network security.
57.0 Game configuration.
58.0 Test programs.
59.0 Plan program design.
60.0 Create and maintain documentation.
61.0 Code programs.
62.0 Demonstrate an understanding of operating systems, environments, and platforms.
63.0 Implement enhanced program structures.
64.0 Implement multimedia programming.
65.0 Develop an understanding of programming techniques and concepts.
66.0 Demonstrate language arts knowledge and skills.
67.0 Demonstrate mathematics knowledge and skills.
68.0 Demonstrate science knowledge and skills.
69.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
70.0 Solve problems using critical thinking skills, creativity and innovation.
71.0 Use information technology tools.
72.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
73.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
74.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
75.0 Describe the importance of professional ethics and legal responsibilities.
76.0 Explain the importance of employability skill and entrepreneurship skills.
77.0 Demonstrate personal money-management concepts, procedures, and strategies.

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Florida Department of Education
Student Performance Standards

Program Title: **Game, Simulation, Animation Programming**
PSAV Number: **B082300**

Course Number: DIG0070
Occupational Completion Point: A
Game/Simulation Designer – 300 Hours – SOC Code 15-1099.13

Game & Simulation Creation

Instruction relating to the standards in this section should be interspersed throughout the entire course with the other standards taught progressively in the context of game design and development.

01.0 Create a game design production plan that describes the game play, outcomes, controls, interface and artistic style of a video game. – The student will be able to:

- 01.01 Use industry standard game design production documents to create a game design production plan.

02.0 Design and create a playable game. – The student will be able to:

- 02.01 Use a number of computer tools to enhance and ease game programming and artistry.
- 02.02 Use a game engine to create a playable game.
- 02.03 Use animated objects.
- 02.04 Program sound and music to enhance the game experience.
- 02.05 Test and debug the completed game.

Critical Game & Simulation Studies

03.0 Categorize the different gaming genres. – The student will be able to:

- 03.01 Research, compare and categorize the different gaming genres.
- 03.02 Analyze examples of different gaming genres.
- 03.03 Define and use the necessary vocabulary related to gaming and the different genres.

04.0 Categorize different gaming systems. – The student will be able to:

- 04.01 Research, compare and categorize different gaming systems.
- 04.02 Analyze the distinctive features of each system.
- 04.03 Define the target audience for different systems based on features, available games, and price of system and games.
- 04.04 Define and use the necessary vocabulary related to gaming hardware.

05.0 Understand the historical significance of electronic and non-electronic games. – The student will be able to:

05.01 Discuss the history of non-electronic games.
05.02 Describe the history and theory of mainstream and experimental media including radio, movies, television, art, and theatre.
05.03 Explain the historical timeline of electronic games, marking the significant highlights in their evolution.

06.0 Describe the trends in current and next-generation game development. – The student will be able to:

06.01 Determine and analyze the significant trends in game development in the past two decades.
06.02 Research and brainstorm the possibilities for the next generation of electronic games based on current and emerging technologies and future predictions.

Societal Impact

07.0 Understand the role of play in human culture. – The student will be able to:

07.01 Discuss the word "play" and its many definitions.
07.02 Discuss the effect of play on today's culture, specifically why it is important and what it provides in terms of balance in our lives.
07.03 Describe the history of play and its importance in developing societies and cultures.
07.04 Investigate and discuss how play can help humans, particularly children, acquire knowledge.
07.05 Describe the benefits of role-playing games and simulations, including online economies and community-building.

08.0 Understand the psychological impact of games on individuals and groups. – The student will be able to:

08.01 Investigate studies that discuss the impact of violent games on children and adults.
08.02 Compare and contrast the different opinions on the effects of games on behavior, cognitive development, and motor skills.
08.03 Research and discuss differing opinions on video game addiction and what would define addiction.
08.04 Examine online digital worlds such as Second Life and the impact these worlds have on individuals and groups.

Management & Industry

09.0 Understand the business model commonly used in the game development industry. – The student will be able to:

09.01 Identify, define and discuss the different ways games are funded, marketed and sold.
09.02 Identify and describe licensing management for different gaming platforms.
09.03 Discuss the product value and business differences between major game platforms.

09.04 Identify successful business models and analyze various facets of those models, such as market analysis, marketing strategy, and product value.

10.0 Examine and categorize the significant processes in the production of interactive games. – The student will be able to:

10.01 Discuss the relationships between publishers, developers, distributors, marketers, and retailers.
10.02 Identify processes of development including content creation, team roles, design documentation, and process management.
10.03 Explore and describe the effects of globalization on the design and production of video games.

11.0 Understand the core tasks and challenges that face a video game design team. – The student will be able to:

11.01 Identify and define the roles and responsibilities of team members on a video game design team.
11.02 Describe the effects of group dynamics and the importance of team building for a design team.
11.03 Explore and discuss methods of communications and scheduling for design teams.
11.04 Describe the importance and interrelationship between development schedule and budget constraints in video game design.

12.0 Understand legal issues that affect games, developers and players. – The student will be able to:

12.01 Define and discuss intellectual property and contract law as it relates to the gaming industry.
12.02 Describe legal and liability issues that could affect online communities.
12.03 Compare and contrast government and industry content regulation and industry ratings of video games.

13.0 Describe the impact of the video game industry on the economy. – The student will be able to:

13.01 Explore and discuss the impact of video games on the economy including domestic sales, foreign exports, and video game rentals.
13.02 Research and describe the effect of game software in driving new technologies and the purchases of video game hardware, gaming PCs, and complementary technologies such as high-definition televisions.
13.03 Analyze the technological transfers from video games to other industries, such as education, medical, corporate training, and military simulation technologies that were developed by the video game industry, as well as 3D "gaming" graphics cards that have found use for other applications.
13.04 Describe how frequent exposure and/or access to video games has reshaped the level of technical proficiency of our work force.

Job Readiness & Career Development

14.0 Demonstrate the professional level of written and oral communication required in the game development industry. – The student will be able to:

14.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
14.02 Organize ideas and communicate oral and written messages appropriate for the game development industry environment
14.03 Identify, define, and discuss terminology appropriate for both internal and external communications in the game development industry environment.

15.0 Demonstrate human relations/interpersonal skills for the workplace. – The student will be able to:

15.01 Solicit and accept constructive criticism.
15.02 Demonstrate personal and interpersonal skills appropriate for the workplace such as responsibility, dependability, punctuality, positive attitude, initiative, respect for self and others, and professional dress.
15.03 Collaborate with individuals and teams to complete tasks and solve problems.

16.0 Investigate career opportunities in the game industry. – The student will be able to:

16.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
16.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.
16.03 Describe job requirements for a variety of occupations within the game development industry.

Game & Simulation Analysis

17.0 Demonstrate an understanding of the vocabulary for discussing games and play. – The student will be able to:

17.01 Identify, define, and discuss professional game design and analysis terminology appropriate for internal and external communications in a game design environment.
17.02 Identify and define the vocabulary used by game players and online gaming communities.

18.0 Demonstrate an understanding of the techniques used to evaluate game mechanics, game play, flow and game design. – The student will be able to:

18.01 Test and analyze games to determine the quality of rules, interfaces, navigation, performance, play, artistry and longevity in design and structure.
18.02 Research and evaluate the game analysis techniques used by the video game industry.
18.03 Identify the key elements in a game and make intelligent judgments about whether the game succeeded or failed in its objectives.
18.04 Evaluate professional reviews and write a critical analysis of a current video game.

19.0 Describe the complex interaction between video games and players and the role it plays in the popularity of a game. – The student will be able to:

19.01 Analyze and deconstruct game environments and interactions.
19.02 Compare and contrast the top selling video games in terms of player interaction, plot complexity, and reward.

Game & Simulation Design

20.0 Understand the general procedure and requirements of game design. – The student will be able to:

20.01 Describe the design process from conception to production.
20.02 Discuss the iterative nature of game and simulation design.
20.03 Develop design plans, character sketches, documentation and storyboards for proposed games.

21.0 Explore the methods used to create and sustain player immersion. – The student will be able to:

21.01 Research and define the term “player immersion”.
21.02 Explore and explain the factors that create player immersion in a game.
21.03 Examine popular games and explain the methods each game uses to increase player immersion.

22.0 Become familiar with popular game tools such as DirectX, 3DMAX, and different gaming engines. – The student will be able to:

22.01 Identify and discuss the popular game development tools currently used in the industry.
22.02 Identify and discuss popular gaming engines.
22.03 Research and analyze the uses for different game development tools.

23.0 Demonstrate an understanding of interface design and hardware constraints on video games including processors and I/O devices. – The student will be able to:

23.01 Identify the different control systems for video games.
23.02 Compare and contrast personal computer and video game console hardware.
23.03 Explain the factors that can limit the game playing ability of personal computers.
23.04 Chart the evolution of video game hardware over the past 20 years.

Game/Simulation Project

Instruction relating to the standards in this section should be interspersed throughout the entire course with the other standards taught progressively in the context of game design and development.

24.0 Create a working game or simulation individually or as part of a team. – The student will be able to:

24.01 Create a storyboard describing the essential elements, plot, flow, and functions of the game/simulation.
24.02 Create a design specification document to include interface and delivery choices, rules of play, navigation functionality, scoring, media choices, start and end of play, special features, and development team credits.
24.03 Using a simple game development tool, create a game or simulation.
24.04 Present the game or simulation.

Design Essentials

25.0 Describe the game development life cycle. – The student will be able to:

25.01 Identify steps in the pre-production process including the proof of concept and market research.
25.02 Describe the iterative prototyping process – Alpha, Beta, RTM.
25.03 Determine scripting requirements.
25.04 Implement techniques of scenario development, levels, and missions.
25.05 Discuss game testing requirements and methods.
25.06 Identify and describe maintenance, upgrade and sequel issues.

26.0 Identify hardware constraints on video games including processors and I/O devices. – The student will be able to:

26.01 Identify the different control systems for video games.
26.02 Compare and contrast personal computer and video game console hardware, including display systems.
26.03 Explain the factors that can limit the game-playing ability of personal computers.

27.0 Identify non-hardware development constraints. – The student will be able to:

27.01 Identify and discuss software integration issues relating to scripting, sound, art animation, game engine and world design software integration.
27.02 Describe constraints such as development time, personnel, talent acquisition, financial/budget constraints, and schedule.
27.03 Describe societal and legal constraints affecting game and simulation design.

Game Design Documentation

28.0 Understand the general principles of storytelling. – The student will be able to:

28.01 Identify the essential elements of a story.
28.02 Describe how creative writing is used as a game design tool.
28.03 Compare and contrast methods of delivering a story in a game.

29.0 Understand the use of storyboarding in game design. – The student will be able to:

29.01 Assess the techniques used in the gaming industry for rendering basic Game Design Art.
29.02 Describe how game layout charts are used in game design.
29.03 Describe how storyboards in the game design process can be used as a pre-development sales tool.

29.04 Analyze and compare the use of storyboards in the game design industry with regard to environmental illustrations, level designs, character designs, model sheets and GUI Designs.

30.0 Develop a game design document or blueprint. – The student will be able to:

30.01 Evaluate and discuss the choice of delivery system.
30.02 Evaluate and discuss choices of genre, game design software, art, digital media, and animation software.
30.03 Create a game strategy overview, character overview, and storyboard overview.
30.04 Define the rules of play and multi-player options.
30.05 Create the layout and interfaces overview and digital media overview.
30.06 Determine the event modeling requirements and create the progression levels overview.
30.07 Define strategic positioning of game immersion dynamics and psychological effect.
30.08 Identify hardware and software constraints.

Game Strategy

31.0 Understand strategic outlining in game designs. – The student will be able to:

31.01 Assess techniques of goal design in gaming.
31.02 Describe the concept of nested victories.
31.03 Discuss the use of players as agents of change.
31.04 Compare and contrast examples of understandable context in gaming.
31.05 Discuss the principles underlying the creation of understandable rules.
31.06 Describe how skill building is used in game design.
31.07 Describe conventional techniques of positive feedback.
31.08 Discuss functional consistency as it relates to the use of interfaces.

32.0 Explore elements of puzzle design. – The student will be able to:

32.01 Describe the essential elements of a puzzle.
32.02 Identify the different types of puzzles.
32.03 Describe the basic principles of high-level puzzle design.
32.04 Describe the basic principles of low-level puzzle design.

33.0 Discuss key strategic considerations in game design. – The student will be able to:

33.01 Describe the use of artificial intelligence challenges in game design and the need for giving the player rest time between challenges.
33.02 Evaluate the impact of randomness in game design especially as it pertains to pattern recognition.
33.03 Identify techniques used in the industry to help the player to navigate.
33.04 Explain the use of “just barely” victories as an exciting and immersive technique.
33.05 Assess techniques used to provide a range of challenges and appeal to a wide range of abilities.
33.06 Describe the psychological cost of failure in games as it pertains to immersion and psychological effect.
33.07 Identify methods of preparing the player for greater challenge while allowing for plot development as the story serves the game.

Rules of Play

34.0 Understand the process of creating and designing player actions. – The student will be able to:

- 34.01 Discuss the principles of player-centric design.
- 34.02 Research and correlate game complexity level to appropriate age group such that content matches user skill set required.
- 34.03 Examine and discuss design elements that encourage continuous active engagement both mental and physical.
- 34.04 Analyze design elements that maintain player interest and vary the degree of challenge.
- 34.05 Discuss the need for a balance of design elements for the purpose of rewarding and frustrating players.

35.0 Create and design the game flow as it relates to story and plot. – The student will be able to:

- 35.01 Identify techniques of introducing the story plot and beginning play.
- 35.02 Describe story plot development techniques for the middle of play in game design.
- 35.03 Analyze and discuss planning techniques for climax and finale of games.

36.0 Assess common principles and procedures in game flow design. – The student will be able to:

- 36.01 Assess missions and scenarios game flow techniques.
- 36.02 Describe common use of mission design and campaigns.
- 36.03 Evaluate usage of static versus dynamic campaigns.

37.0 Describe rule creation elements of player challenge. – The student will be able to:

- 37.01 Research common design methods for clearing obstacles or series of obstacles.
- 37.02 Describe common design elements introducing skill, luck and combinations including escalating challenges to games.
- 37.03 Identify common design elements used to vary weapons, characters and tools.
- 37.04 Discuss the incorporation of risk reward and adaptive challenges (AI).
- 37.05 Evaluate industry use of boss encounters in games.
- 37.06 Analyze and discuss design considerations from the perspective of other players and multi-player environments.

Game Development Tools

38.0 Identify tools and software commonly used in game development. – The student will be able to:

- 38.01 Identify and discuss the popular game development tools currently used in the industry.
- 38.02 Identify and discuss popular gaming engines.
- 38.03 Identify and discuss popular world building tools.

Music, Sound, Art & Animation

39.0 Understand the methodologies for integrating digital media into a game or simulation. – The student will be able to:

- 39.01 Survey and discuss the use of naming conventions and temp sounds.
- 39.02 Analyze and discuss methods of matching sound effects to art assets.
- 39.03 Identify and categorize commonly used technology sound engine integration equipment.
- 39.04 Identify and discuss resources such as sound effects libraries.
- 39.05 Examine methods of sound implementation and associated software.
- 39.06 Describe how and why digital video may be integrated into a game or simulation design.
- 39.07 Describe how special effects differ from animation.

40.0 Identify commonly used art and animation production tools in the game design industry. – The student will be able to:

- 40.01 Identify, categorize and discuss art and animation tools commonly used in game design.

Environmental Design

41.0 Understand the general concepts of environmental design. – The student will be able to:

- 41.01 Survey and evaluate commonly used concept art.
- 41.02 Create a world sketch with particular attention to maintaining continuity of style.
- 41.03 Describe the emotional/psychological aspects of environmental design that signify mood, façade of freedom, and resource struggling.

42.0 Describe how environmental design is used in conjunction with game level design. – The student will be able to:

- 42.01 Examine and evaluate examples of focus on a theme.
- 42.02 Describe methods of creating a purposeful architecture giving consideration to continuity and themes and taking advantage of revisiting.
- 42.03 Consider and discuss environmental design elements for multi-player or single player games.
- 42.04 Describe the history of creating shifts in game design environments and embracing novel ideas.
- 42.05 Identify and discuss environmental design pitfalls such as red herrings and cookie-cutter layouts.

Event Modeling in Game Design

43.0 Define the meaning of simulation and pertinent issues facing game designers. – The student will be able to:

- 43.01 Discuss the meaning of simulation and give examples of simulation and complexity including architecture, exposure, concealment and heuristics.

43.02 Describe applied event modeling including goal discovery, map making, event exploration, developing incentives and learning in event modeling for games.
43.03 Explain the concepts of modes of understanding, inductive and iconic logic, significance and saturation in event modeling for game design.

44.0 Describe applied event modeling as it relates to game design. – The student will be able to:

44.01 Discuss the process of specifying events including contexts of simulation, translating event models to simulations, formalizing thematic objectives, prototyping, interface design and use cases with modeling.
44.02 Describe the design of an application framework including extensible frameworks, software design, configuration, encapsulation, windows and message loops.
44.03 Describe the implementation of an application framework including adding graphics, GUI events and controls, and creating a console.
44.04 Discuss the process of designing entities including behavior and entity graphics.
44.05 Describe the implementation of entities including enumerating animations, playing with time, creating events, adding an entity class, and creating entity events and behaviors.
44.06 Analyze event modeling in creating a world including the creation of a world class, adding and removing entities, accessing entities, updating and rendering, adding scene hierarchies and handling world events.
44.07 Assess and discuss AI and physics issues for simulation including AI event contexts, adding intelligence and gravity, adding collision detection, updating for collisions and applying mass and force.
44.08 Discuss environmental elements of simulation including logic, cognitive saturation, systems and interpretation, context of reality, shadows and lighting.
44.09 Discuss the simulation of physical systems such as trees and forests and related events such as fires, or insect swarms such as beehives, bird flocks or anthills.
44.10 Describe the simulation of social and economic systems including practical applications, historical precedents, modeling for community events, creation of communities including structures, states events and rendering and altering building states, population behaviors, and controlling influences.
44.11 Describe the process of testing simulations and event models including effectiveness, diagrammatic systems evaluation, context influence, path transitions and assessing messages.

Interface Design

45.0 Understand basic HCI principles. – The student will be able to:

45.01 Define and give examples of how HCI principles are considered in designing a game or simulation.
45.02 Describe how client user background, education, goals, motivation, training, culture, age, gender, physical abilities and client sophistication affect interface design.

46.0 Discuss the eight golden rules of HCI. – The student will be able to:

46.01 Discuss the need for functional consistency, shortcuts, feedback, closure, error prevention, easy reversal of actions, feeling in control, and avoiding memory overload.
46.02 Identify game design enhancements that could make better use of HCI Principles.

47.0 Understand the use of inventory systems in game design. – The student will be able to:

47.01 Discuss the various methods of describing items in player's inventory in contemporary game design.
47.02 Review and discuss industry methods of communicating how inventory items can have an effect on game play.

66.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

66.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
66.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
66.03 Present information formally and informally for specific purposes and audiences. AF2.9

67.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

67.01 Demonstrate knowledge of arithmetic operations. AF3.2
67.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
67.03 Construct charts/tables/graphs using functions and data. AF3.5

68.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

68.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
68.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

69.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

69.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
69.02 Locate, organize and reference written information from various sources. CM 3.0
69.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
69.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
69.05 Apply active listening skills to obtain and clarify information. CM 7.0
69.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
69.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

70.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

70.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
70.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
70.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
70.04 Conduct technical research to gather information necessary for decision-making. PS 4.0

71.0 Use information technology tools. – The student will be able to:

71.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
71.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
71.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
71.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

72.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

72.01 Describe the nature and types of business organizations. SY 1.0
72.02 Explain the effect of key organizational systems on performance and quality.
72.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
72.04 Explain the impact of the global economy on business organizations.

75.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

75.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
75.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
75.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
75.04 Interpret and explain written organizational policies and procedures. ELR 2.0

Course Number: DIG0075
Occupational Completion Point – B
Game/Simulation Programmer – 150 Hours – SOC Code 15-1021

48.0 Identify functions of information processing. – The student will be able to:

48.01 Identify characteristics of high-level languages.
48.02 Identify characteristics of operating systems.
48.03 Identify characteristics of a network.
48.04 Identify needs for software development in the game/simulation industry.
48.05 Identify causes of software development problems in the game/simulation industry.
48.06 Identify most appropriate languages for solving game/simulation industry

problems.
48.07 Manipulate data between numbering systems.
48.08 Identify how numeric and non-numeric data are represented in memory.
48.09 Distinguish among integer, fixed-point, and floating-point calculations.

49.0 Test programs. – The student will be able to:

49.01 Develop a plan for testing programs.
49.02 Develop test harnesses for use in program testing.
49.03 Perform debugging activities.
49.04 Distinguish among the different types of program and design errors.
49.05 Evaluate program test results.
49.06 Execute programs and subroutines as they relate to the total application.
49.07 Use trace routines of compilers to assist in program debugging.
49.08 Compile and run programs.
49.09 Create a stable code base.

50.0 Plan program design. – The student will be able to:

50.01 Formulate a plan to determine program specifications individually or in groups.
50.02 Use a graphical representation or pseudo code to represent the structure in a program or subroutine.
50.03 Design programs to solve problems using problem-solving strategies.
50.04 Prepare proper input/output layout specifications.
50.05 Examine existing utility programs and subroutines for use with other programs.
50.06 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.

51.0 Code programs. – The student will be able to:

51.01 Utilize reference manuals.
51.02 Write programs according to recognized programming standards.
51.03 Write internal documentation statements as needed in the program source code.
51.04 Code programs in high-level languages for game/simulation applications.
51.05 Write code that accesses sequential, random, and direct files.
51.06 Code programs using logical statements (e.g., If-Then-Else, Do...While).
51.07 Enter and modify source code using a program language editor.
51.08 Code routines within programs that validate input data.
51.09 Use the rounding function in calculations within programs.
51.10 Write programs as part of a development team.
51.11 Write event-driven programs.
51.12 Write programs using timed-event strategies and methodologies.
51.13 Write programs that include score keeping.

52.0 Perform program maintenance. – The student will be able to:

52.01 Review requested modification of programs and establish a plan of action.
52.02 Design needed modifications in conformance with established standards.
52.03 Code, test, and debug modifications prior to updating production code.
52.04 Update production programs and documentation with changes.
52.05 Analyze output to identify and annotate errors or enhancements.

53.0 Create and maintain documentation. – The student will be able to:

53.01 Write documentation to assist operators and end-users.
53.02 Follow established documentation standards.
53.03 Update existing documentation to reflect program changes.

54.0 Evaluate assigned game programming tasks. – The student will be able to:

54.01 Estimate the time necessary to write a program.

55.0 Implement enhanced program structures. – The student will be able to:

55.01 Write programs that include tables or arrays and routines for data entry and lookup.
55.02 Write programs to import/export data from external sources.
55.03 Write programs that use iteration.
55.04 Write routines that incorporate “help” text.
55.05 Write programs that read and write random files.
55.06 Write interactive programs.
55.07 Design screen layouts for use in interactive programs.
55.08 Write programs using object-oriented languages.
55.09 Write programs that include data structures (e.g., stacks, queues, trees, linked lists).
55.10 Write programs that are event-driven to support player goals and actions.

73.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

73.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
73.02 Explain emergency procedures to follow in response to workplace accidents.
73.03 Create a disaster and/or emergency response plan. SHE 2.0

74.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

74.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
74.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
74.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
74.04 Employ mentoring skills to inspire and teach others. LT 5.0

76.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

76.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
76.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
76.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
76.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0

76.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
76.06 Identify and exhibit traits for retaining employment. ECD 7.0
76.07 Identify opportunities and research requirements for career advancement. ECD 8.0
76.08 Research the benefits of ongoing professional development. ECD 9.0
76.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

77.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

77.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
77.02 Describe the effect of money management on personal and career goals. FL 3.0
77.03 Develop a personal budget and financial goals. FL3.1
77.04 Complete financial instruments for making deposits and withdrawals. FL3.2
77.05 Maintain financial records. FL3.3
77.06 Read and reconcile financial statements. FL3.4
77.07 Research, compare and contrast investment opportunities.

Course Number: DIG0076
Occupational Completion Point – C
Game/Simulation Software Developer – 150 Hours – SOC Code 15-1021

56.0 Identify and describe basic network terminology and network security. – The student will be able to:

56.01 Define networking and describe the purpose of a network.
56.02 Identify the purposes and interrelationships among the major components of networks (e.g., servers, clients, transmission media, network operating system, network boards).
56.03 Describe the various types of network topologies.
56.04 Describe the various types of game protocols
56.05 Demonstrate knowledge of general security concepts.
56.06 Develop an awareness of communication security concepts.
56.07 Develop an awareness of network infrastructure security.
56.08 Describe the various types of multiplayer game architectures
56.09 Identify networking and server design requirements for multi-player games
56.10 List and describe performance metrics for networked games

57.0 Game configuration. – The student will be able to:

57.01 Create a window to run a game.
57.02 Describe and use appropriate game libraries to run a windowed game.
57.03 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available
57.04 Troubleshoot problems with computer hardware based on different graphic modes of the game
57.05 Describe ethical issues and problems associated with computer games.

57.06 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
57.07 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.
57.08 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
57.09 Identify characteristics of operating systems and graphics pipeline
57.10 Distinguish among integer and floating-point bounding box collision calculations...
57.11 Illustrate various configurations of software libraries.

58.0 Test programs. – The student will be able to:
58.01 Develop data for use in program testing.
58.02 Perform debugging activities.
58.03 Distinguish among the different types of program and design errors.
58.04 Evaluate program test results.
58.05 Execute programs and subroutines as they relate to the total application.
58.06 Use trace routines of compilers to assist in program debugging.
58.07 Compile and run programs.

59.0 Plan program design. – The student will be able to:

59.01 Formulate a plan to determine program specifications individually or in groups.
59.02 Use a graphical representation or pseudo code to represent the structure in a program or subroutine.
59.03 Design programs to solve problems using problem-solving strategies.
59.04 Prepare proper input/output layout specifications.
59.05 Examine existing utility programs and subroutines for use with other programs.
59.06 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.

60.0 Create and maintain documentation. – The student will be able to:

60.01 Write documentation to assist operators and end-users.
60.02 Follow established documentation standards.
60.03 Update existing documentation to reflect program changes.

61.0 Code programs. – The student will be able to:

61.01 Utilize reference manuals.
61.02 Write programs according to recognized programming standards.
61.03 Write internal documentation statements as needed in the program source code.
61.04 Code programs in high-level languages for gaming and simulation applications.
61.05 Write code that accesses sequential, indexed sequential, random, and direct files.
61.06 Code programs using logical statements (e.g., if-then-else, do...while).
61.07 Enter and modify source code using a program language editor.
61.08 Code routines within programs that validate input data.
61.09 Use the rounding function in calculations within programs.
61.10 Write programs that display text

61.11 Demonstrate proficiency in drawing lines using graphic primitive functions.
61.12 Demonstrate proficiency in drawing rectangles using graphic primitive functions.
61.13 Demonstrate proficiency in drawing circles using graphic primitive functions.
61.14 Demonstrate proficiency in drawing ellipses using graphic primitive functions.
61.15 Demonstrate proficiency in drawing polygons using graphic primitive functions.
61.16 Write programs that use composite graphic objects
61.17 Write programs that load a bitmap for background
61.18 Write programs that use a sprite handler
61.19 Write programs that use animation
61.20 Write programs that use scrolling
61.21 Write programs that use transparency

62.0 Demonstrate an understanding of operating systems, environments, and platforms. – The student will be able to:

62.01 Identify various types of operating systems/environments for different computer hardware platforms.
62.02 Assess and analyze the functions of different operating systems.
62.03 Distinguish between different types of computer hardware platforms.

63.0 Implement enhanced program structures. – The student will be able to:

63.01 Write programs that include tables or arrays and routines for data entry and lookup.
63.02 Write routines to sort arrays.
63.03 Write programs that sort records in files.
63.04 Write programs to process transactions.
63.05 Write programs that use iteration.
63.06 Write programs that read and write sequential files.
63.07 Write programs that read and write random files.

64.0 Implement multimedia programming. – The student will be able to:

64.01 Demonstrate proficiency in creating multiple composite objects.
64.02 Demonstrate proficiency in moving composite graphics objects.
64.03 Demonstrate proficiency in rotating composite graphics objects by hand.
64.04 Distinguish between flock and flee artificial intelligence algorithms.
64.05 Write programs that use blitting.
64.06 Simulate circular game board.
64.07 Demonstrate proficiency in creating a firing simulation.
64.08 Identify the basic constructs used in bounding box collision algorithm.
64.09 Identify the basic constructs used in truer bounding box collision.
64.10 Demonstrate proficiency in creating a creating a bouncing simulation.
64.11 Simulate pattern based movement.
64.12 Simulate multiple sprites movement.
64.13 Identify the basic constructs used in keyboard input.
64.14 Identify the basic constructs used in mouse input.
64.15 Identify the basic constructs used in double buffering.

65.0 Develop an understanding of programming techniques and concepts. – The student will be able to:

65.01 Identify the basic constructs used in structured programming.
65.02 Distinguish between top-down and bottom-up design.
65.03 Distinguish between iteration and recursion.
65.04 Evaluate Boolean expressions.
65.05 Distinguish between interpreters and compilers.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Game & Simulation Foundations**
Course Number: **8208110**
Course Credit: **1**

Course Description:

This course is designed to provide an introduction to game and simulation concepts and careers, the impact game and simulation has on society and industry, and basic game/simulation design concepts such as rule design, play mechanics, and media integration. This course compares and contrasts games and simulations, key development methodologies and tools, careers, and industry-related information. This course also covers strategies, processes, and methods for conceptualizing a game or simulation application; storyboarding techniques; and development tools.

Hands-on activities using an entry-level game development tool such as Game Maker or Alice should be integrated into the curriculum. **Regardless of topic sequencing, the culminating activity is the creation of a playable game.**

Game & Simulation Creation

Instruction relating to the standards in this section should be interspersed throughout the entire course with the other standards taught progressively in the context of game design and development.

01.0 Create a game design production plan that describes the game play, outcomes, controls, interface and artistic style of a video game. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.D.5.1; MA.912.D.5.2.

01.01 Use industry standard game design production documents to create a game design production plan.

02.0 Design and create a playable game. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.D.5.1; MA.912.D.5.2; SC.912.P.10.1; SC.912.P.10.2; SC.912.P.10.5; SC.912.P.10.16; SC.912.P.12.2.

02.01 Use a number of computer tools to enhance and ease game programming and artistry.
02.02 Use a game engine to create a playable game.
02.03 Use animated objects.
02.04 Program sound and music to enhance the game experience.
02.05 Test and debug the completed game.

Critical Game & Simulation Studies

03.0 Categorize the different gaming genres. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.D.7.2.

03.01 Research, compare and categorize the different gaming genres.
03.02 Analyze examples of different gaming genres.
03.03 Define and use the necessary vocabulary related to gaming and the different genres.

04.0 Categorize different gaming systems. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.A.2.13; MA.912.A.3.15; MA.912.F.5.1; MA.912.F.5.2.

04.01 Research, compare and categorize different gaming systems.
04.02 Analyze the distinctive features of each system.
04.03 Define the target audience for different systems based on features, available games, and price of system and games.
04.04 Define and use the necessary vocabulary related to gaming hardware.

05.0 Understand the historical significance of electronic and non-electronic games. – The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.P.10.18; SC.912.P.10.20.

05.01 Discuss the history of non-electronic games.
05.02 Describe the history and theory of mainstream and experimental media including radio, movies, television, art, and theatre.
05.03 Explain the historical timeline of electronic games, marking the significant highlights in their evolution.

06.0 Describe the trends in current and next-generation game development. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.A.3.10; MA.912.A.3.11; MA.912.A.3.12; MA.912.A.3.13; MA.912.A.3.14; MA.912.A.3.15; MA.912.A.10.1; SC.912.N.1.7; SC.912.N.3.5; SC.912.P.10.2; SC.912.P.10.10; SC.912.P.12.2; SC.912.P.12.3; SC.912.P.12.5; SC.912.P.12.6.

06.01 Determine and analyze the significant trends in game development in the past two decades.
06.02 Research and brainstorm the possibilities for the next generation of electronic games based on current and emerging technologies and future predictions.

Societal Impact

07.0 Understand the role of play in human culture. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.A.10.2.

07.01 Discuss the word “play” and its many definitions.
07.02 Discuss the effect of play on today’s culture, specifically why it is important and what it provides in terms of balance in our lives.
07.03 Describe the history of play and its importance in developing societies and cultures.
07.04 Investigate and discuss how play can help humans, particularly children, acquire knowledge.
07.05 Describe the benefits of role-playing games and simulations, including online economies and community-building.

08.0 Understand the psychological impact of games on individuals and groups. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.A.10.1; SC.912.N.2.3; SC.912.N.2.4; SC.912.N.2.5; SC.912.N.4.2; SC.912.N.3.1.

08.01 Investigate studies that discuss the impact of violent games on children and adults.
08.02 Compare and contrast the different opinions on the effects of games on behavior, cognitive development, and motor skills.
08.03 Research and discuss differing opinions on video game addiction and what would define addiction.
08.04 Examine online digital worlds such as Second Life and the impact these worlds have on individuals and groups.

Management & Industry

09.0 Understand the business model commonly used in the game development industry. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.F.5.1; MA.912.F.5.2; MA.912.3.11; MA.912.2.13; MA.912.3.15; MA.912.A.10.1; MA.912.D.6.6; MA.912.D.4.1; MA.912.D.7.2.

09.01 Identify, define and discuss the different ways games are funded, marketed and sold.
09.02 Identify and describe licensing management for different gaming platforms.
09.03 Discuss the product value and business differences between major game platforms.
09.04 Identify successful business models and analyze various facets of those models, such as market analysis, marketing strategy, and product value.

10.0 Examine and categorize the significant processes in the production of interactive games. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.A.10.1; SC.912.N.1.1; SC.912.N.1.5.

10.01 Discuss the relationships between publishers, developers, distributors, marketers, and retailers.

10.02 Identify processes of development including content creation, team roles, design documentation, and process management.
10.03 Explore and describe the effects of globalization on the design and production of video games.

11.0 Understand the core tasks and challenges that face a video game design team. – The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1; MA.912.D.4.1; MA.912.A.10.1.

11.01 Identify and define the roles and responsibilities of team members on a video game design team.
11.02 Describe the effects of group dynamics and the importance of team building for a design team.
11.03 Explore and discuss methods of communications and scheduling for design teams.
11.04 Describe the importance and interrelationship between development schedule and budget constraints in video game design.

12.0 Understand legal issues that affect games, developers and players. – The student will be able to:

12.01 Define and discuss intellectual property and contract law as it relates to the gaming industry.
12.02 Describe legal and liability issues that could affect online communities.
12.03 Compare and contrast government and industry content regulation and industry ratings of video games.

13.0 Describe the impact of the video game industry on the economy. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.D.7.2; MA.912.D.4.1; MA.912.A.10.1; SC.912.N.2.1.

13.01 Explore and discuss the impact of video games on the economy including domestic sales, foreign exports, and video game rentals.
13.02 Research and describe the effect of game software in driving new technologies and the purchases of video game hardware, gaming PCs, and complementary technologies such as high-definition televisions.
13.03 Analyze the technological transfers from video games to other industries, such as education, medical, corporate training, and military simulation technologies that were developed by the video game industry, as well as 3D "gaming" graphics cards that have found use for other applications.
13.04 Describe how frequent exposure and/or access to video games has reshaped the level of technical proficiency of our work force.

Job Readiness & Career Development

14.0 Demonstrate the professional level of written and oral communication required in the game development industry. – The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1.

14.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
14.02 Organize ideas and communicate oral and written messages appropriate for the game development industry environment
14.03 Identify, define, and discuss terminology appropriate for both internal and external communications in the game development industry environment.

15.0 Demonstrate human relations/interpersonal skills for the workplace. – The student will be able to:

15.01 Solicit and accept constructive criticism.
15.02 Demonstrate personal and interpersonal skills appropriate for the workplace such as responsibility, dependability, punctuality, positive attitude, initiative, respect for self and others, and professional dress.
15.03 Collaborate with individuals and teams to complete tasks and solve problems.

16.0 Investigate career opportunities in the game industry. – The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.4.2.

16.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
16.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.
16.03 Describe job requirements for a variety of occupations within the game development industry.

Game & Simulation Analysis

17.0 Demonstrate an understanding of the vocabulary for discussing games and play. – The student will be able to:

17.01 Identify, define, and discuss professional game design and analysis terminology appropriate for internal and external communications in a game design environment.
17.02 Identify and define the vocabulary used by game players and online gaming communities.

18.0 Demonstrate an understanding of the techniques used to evaluate game mechanics, game play, flow and game design. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.D.5.1; MA.912.D.5.2.

18.01 Test and analyze games to determine the quality of rules, interfaces, navigation, performance, play, artistry and longevity in design and structure.
18.02 Research and evaluate the game analysis techniques used by the video game industry.

18.03 Identify the key elements in a game and make intelligent judgments about whether the game succeeded or failed in its objectives.
18.04 Evaluate professional reviews and write a critical analysis of a current video game.

19.0 Describe the complex interaction between video games and players and the role it plays in the popularity of a game. – The student will be able to:

19.01 Analyze and deconstruct game environments and interactions.
19.02 Compare and contrast the top selling video games in terms of player interaction, plot complexity, and reward.

Game & Simulation Design

20.0 Understand the general procedure and requirements of game design. – The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.7.

20.01 Describe the design process from conception to production.
20.02 Discuss the iterative nature of game and simulation design.
20.03 Develop design plans, character sketches, documentation and storyboards for proposed games.

21.0 Explore the methods used to create and sustain player immersion. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.A.5.1; MA.912.A.5.4.

21.01 Research and define the term “player immersion”.
21.02 Explore and explain the factors that create player immersion in a game.
21.03 Examine popular games and explain the methods each game uses to increase player immersion.

22.0 Become familiar with popular game tools such as DirectX, 3DMAX, and different gaming engines. – The student will be able to:

22.01 Identify and discuss the popular game development tools currently used in the industry.
22.02 Identify and discuss popular gaming engines.
22.03 Research and analyze the uses for different game development tools.

23.0 Demonstrate an understanding of interface design and hardware constraints on video games including processors and I/O devices. – The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.P.10.13; SC.912.P.10.14; SC.912.P.10.15; SC.912.P.10.16; SC.912.P.10.17; SC.912.P.10.18; SC.912.P.12.9; SC.912.L17.15; SC.912.L.17.16; SC.912.L.17.17; SC.912.L.17.18.

23.01 Identify the different control systems for video games.

23.02 Compare and contrast personal computer and video game console hardware.
23.03 Explain the factors that can limit the game playing ability of personal computers.
23.04 Chart the evolution of video game hardware over the past 20 years.

66.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

66.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
66.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
66.03 Present information formally and informally for specific purposes and audiences. AF2.9

67.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

67.01 Demonstrate knowledge of arithmetic operations. AF3.2
67.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
67.03 Construct charts/tables/graphs using functions and data. AF3.5

68.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

68.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
68.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

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Student Performance Standards

Course Title: **Game & Simulation Design**
Course Number: **8208120**
Course Credit: **1**

Course Description:

This course covers fundamental principles of designing a game or a simulation application, in particular Human Computer Interface (HCI) principles, rules and strategies of play, conditional branching, design and development constraints, use of sound and animation, design tools, and implementation issues. The content includes market research, product design documentation, storyboarding, proposal development, and presentation of a project report. Emphasis is placed on the techniques needed to develop well-documented, structured game or simulation programs. Extensive use is made of evaluating and analyzing existing games or simulations.

Hands-on activities using an entry-level game development tool such as Game Maker or Alice should be integrated into the curriculum. **Regardless of topic sequencing, the culminating activity is the creation and presentation of a playable game with design documentation.**

Game/Simulation Project

Instruction relating to the standards in this section should be interspersed throughout the entire course with the other standards taught progressively in the context of game design and development.

24.0 Create a working game or simulation individually or as part of a team. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.D.5.1; MA.912.D.5.2; SC.912.N.1.1.

- 24.01 Create a storyboard describing the essential elements, plot, flow, and functions of the game/simulation.
- 24.02 Create a design specification document to include interface and delivery choices, rules of play, navigation functionality, scoring, media choices, start and end of play, special features, and development team credits.
- 24.03 Using a simple game development tool, create a game or simulation.
- 24.04 Present the game or simulation.

Design Essentials

25.0 Describe the game development life cycle. – The student will be able to:

- 25.01 Identify steps in the pre-production process including the proof of concept and market research.
- 25.02 Describe the iterative prototyping process – Alpha, Beta, RTM.
- 25.03 Determine scripting requirements.
- 25.04 Implement techniques of scenario development, levels, and missions.

25.05 Discuss game testing requirements and methods.
25.06 Identify and describe maintenance, upgrade and sequel issues.

26.0 Identify hardware constraints on video games including processors and I/O devices. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.A.2.13; MA.912.A.4.1; SC.912.P.10.13; SC.912.P.10.14; SC.912.P.10.15; SC.912.P.10.18.

26.01 Identify the different control systems for video games.
26.02 Compare and contrast personal computer and video game console hardware, including display systems.
26.03 Explain the factors that can limit the game-playing ability of personal computers.

27.0 Identify non-hardware development constraints. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.A.4.1.

27.01 Identify and discuss software integration issues relating to scripting, sound, art animation, game engine and world design software integration.
27.02 Describe constraints such as development time, personnel, talent acquisition, financial/budget constraints, and schedule.
27.03 Describe societal and legal constraints affecting game and simulation design.

Game Design Documentation

28.0 Understand the general principles of storytelling. – The student will be able to:

28.01 Identify the essential elements of a story.
28.02 Describe how creative writing is used as a game design tool.
28.03 Compare and contrast methods of delivering a story in a game.

29.0 Understand the use of storyboarding in game design. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.G.8.6; MA.912.G.1.1.

29.01 Assess the techniques used in the gaming industry for rendering basic Game Design Art.
29.02 Describe how game layout charts are used in game design.
29.03 Describe how storyboards in the game design process can be used as a pre-development sales tool.
29.04 Analyze and compare the use of storyboards in the game design industry with regard to environmental illustrations, level designs, character designs, model sheets and GUI Designs.

30.0 Develop a game design document or blueprint. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.G.8.6; MA.912.G.1.1.

30.01 Evaluate and discuss the choice of delivery system.
30.02 Evaluate and discuss choices of genre, game design software, art, digital media, and animation software.
30.03 Create a game strategy overview, character overview, and storyboard overview.
30.04 Define the rules of play and multi-player options.
30.05 Create the layout and interfaces overview and digital media overview.
30.06 Determine the event modeling requirements and create the progression levels overview.
30.07 Define strategic positioning of game immersion dynamics and psychological effect.
30.08 Identify hardware and software constraints.

Game Strategy

31.0 Understand strategic outlining in game designs. – The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1.

31.01 Assess techniques of goal design in gaming.
31.02 Describe the concept of nested victories.
31.03 Discuss the use of players as agents of change.
31.04 Compare and contrast examples of understandable context in gaming.
31.05 Discuss the principles underlying the creation of understandable rules.
31.06 Describe how skill building is used in game design.
31.07 Describe conventional techniques of positive feedback.
31.08 Discuss functional consistency as it relates to the use of interfaces.

32.0 Explore elements of puzzle design. – The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.P.10.14; SC.912.P.10.15.

32.01 Describe the essential elements of a puzzle.
32.02 Identify the different types of puzzles.
32.03 Describe the basic principles of high-level puzzle design.
32.04 Describe the basic principles of low-level puzzle design.

33.0 Discuss key strategic considerations in game design. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.P.1.1; MA.912.P.1.2; MA.912.P.2.1; MA.912.P.2.2; MA.912.P.2.3; MA.912.P.3.1; SC.912.L.17.15.

33.01 Describe the use of artificial intelligence challenges in game design and the need for giving the player rest time between challenges.
33.02 Evaluate the impact of randomness in game design especially as it pertains to pattern recognition.
33.03 Identify techniques used in the industry to help the player to navigate.
33.04 Explain the use of “just barely” victories as an exciting and immersive technique.
33.05 Assess techniques used to provide a range of challenges and appeal to a wide range of abilities.

33.06 Describe the psychological cost of failure in games as it pertains to immersion and psychological effect.
33.07 Identify methods of preparing the player for greater challenge while allowing for plot development as the story serves the game.

Rules of Play

34.0 Understand the process of creating and designing player actions. – The student will be able to:

34.01 Discuss the principles of player-centric design.
34.02 Research and correlate game complexity level to appropriate age group such that content matches user skill set required.
34.03 Examine and discuss design elements that encourage continuous active engagement both mental and physical.
34.04 Analyze design elements that maintain player interest and vary the degree of challenge.
34.05 Discuss the need for a balance of design elements for the purpose of rewarding and frustrating players.

35.0 Create and design the game flow as it relates to story and plot. – The student will be able to:

35.01 Identify techniques of introducing the story plot and beginning play.
35.02 Describe story plot development techniques for the middle of play in game design.
35.03 Analyze and discuss planning techniques for climax and finale of games.

36.0 Assess common principles and procedures in game flow design. – The student will be able to:

36.01 Assess missions and scenarios game flow techniques.
36.02 Describe common use of mission design and campaigns.
36.03 Evaluate usage of static versus dynamic campaigns.

37.0 Describe rule creation elements of player challenge. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.D.6.3; MA.912.D.6.4.

37.01 Research common design methods for clearing obstacles or series of obstacles.
37.02 Describe common design elements introducing skill, luck and combinations including escalating challenges to games.
37.03 Identify common design elements used to vary weapons, characters and tools.
37.04 Discuss the incorporation of risk reward and adaptive challenges (AI).
37.05 Evaluate industry use of boss encounters in games.
37.06 Analyze and discuss design considerations from the perspective of other players and multi-player environments.

Game Development Tools

38.0 Identify tools and software commonly used in game development. – The student will be able to:

38.01 Identify and discuss the popular game development tools currently used in the industry.
38.02 Identify and discuss popular gaming engines.
38.03 Identify and discuss popular world building tools.

Music, Sound, Art & Animation

39.0 Understand the methodologies for integrating digital media into a game or simulation. – The student will be able to:

39.01 Survey and discuss the use of naming conventions and temp sounds.
39.02 Analyze and discuss methods of matching sound effects to art assets.
39.03 Identify and categorize commonly used technology sound engine integration equipment.
39.04 Identify and discuss resources such as sound effects libraries.
39.05 Examine methods of sound implementation and associated software.
39.06 Describe how and why digital video may be integrated into a game or simulation design.
39.07 Describe how special effects differ from animation.

40.0 Identify commonly used art and animation production tools in the game design industry. – The student will be able to:

40.01 Identify, categorize and discuss art and animation tools commonly used in game design.

Environmental Design

41.0 Understand the general concepts of environmental design. – The student will be able to:

41.01 Survey and evaluate commonly used concept art.
41.02 Create a world sketch with particular attention to maintaining continuity of style.
41.03 Describe the emotional/psychological aspects of environmental design that signify mood, façade of freedom, and resource struggling.

42.0 Describe how environmental design is used in conjunction with game level design. – The student will be able to:

42.01 Examine and evaluate examples of focus on a theme.
42.02 Describe methods of creating a purposeful architecture giving consideration to continuity and themes and taking advantage of revisiting.
42.03 Consider and discuss environmental design elements for multi-player or single player games.
42.04 Describe the history of creating shifts in game design environments and embracing novel ideas.
42.05 Identify and discuss environmental design pitfalls such as red herrings and cookie-cutter layouts.

Event Modeling in Game Design

43.0 Define the meaning of simulation and pertinent issues facing game designers. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.G.2.4.

- 43.01 Discuss the meaning of simulation and give examples of simulation and complexity including architecture, exposure, concealment and heuristics.
- 43.02 Describe applied event modeling including goal discovery, map making, event exploration, developing incentives and learning in event modeling for games.
- 43.03 Explain the concepts of modes of understanding, inductive and iconic logic, significance and saturation in event modeling for game design.

44.0 Describe applied event modeling as it relates to game design. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.G.2.4; SC.912.P.8.7; SC.912.P.10.1; SC.912.P.10.2; SC.912.P.10.4; SC.912.P.10.5; SC.912.P.10.10; SC.912.P.12.3; SC.912.P.12.4; SC.912.P.12.5; SC.912.P.12.6; SC.912.L.14.16; SC.912.L.17.5; SC.912.L.17.15; SC.912.N.1.7

- 44.01 Discuss the process of specifying events including contexts of simulation, translating event models to simulations, formalizing thematic objectives, prototyping, interface design and use cases with modeling.
- 44.02 Describe the design of an application framework including extensible frameworks, software design, configuration, encapsulation, windows and message loops.
- 44.03 Describe the implementation of an application framework including adding graphics, GUI events and controls, and creating a console.
- 44.04 Discuss the process of designing entities including behavior and entity graphics.
- 44.05 Describe the implementation of entities including enumerating animations, playing with time, creating events, adding an entity class, and creating entity events and behaviors.
- 44.06 Analyze event modeling in creating a world including the creation of a world class, adding and removing entities, accessing entities, updating and rendering, adding scene hierarchies and handling world events.
- 44.07 Assess and discuss AI and physics issues for simulation including AI event contexts, adding intelligence and gravity, adding collision detection, updating for collisions and applying mass and force.
- 44.08 Discuss environmental elements of simulation including logic, cognitive saturation, systems and interpretation, context of reality, shadows and lighting.
- 44.09 Discuss the simulation of physical systems such as trees and forests and related events such as fires, or insect swarms such as beehives, bird flocks or anthills.
- 44.10 Describe the simulation of social and economic systems including practical applications, historical precedents, modeling for community events, creation of communities including structures, states events and rendering and altering building states, population behaviors, and controlling influences.
- 44.11 Describe the process of testing simulations and event models including effectiveness, diagrammatic systems evaluation, context influence, path transitions and assessing messages.

Interface Design

45.0 Understand basic HCI principles. – The student will be able to:

- 45.01 Define and give examples of how HCI principles are considered in designing a game or simulation.
- 45.02 Describe how client user background, education, goals, motivation, training, culture, age, gender, physical abilities and client sophistication affect interface design.

46.0 Discuss the eight golden rules of HCI. – The student will be able to:

- 46.01 Discuss the need for functional consistency, shortcuts, feedback, closure, error prevention, easy reversal of actions, feeling in control, and avoiding memory overload.
- 46.02 Identify game design enhancements that could make better use of HCI Principles.

47.0 Understand the use of inventory systems in game design. – The student will be able to:

- 47.01 Discuss the various methods of describing items in player's inventory in contemporary game design.
- 47.02 Review and discuss industry methods of communicating how inventory items can have an effect on game play.

69.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

- 69.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
- 69.02 Locate, organize and reference written information from various sources. CM 3.0
- 69.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
- 69.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
- 69.05 Apply active listening skills to obtain and clarify information. CM 7.0
- 69.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
- 69.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

70.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

- 70.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
- 70.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
- 70.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
- 70.04 Conduct technical research to gather information necessary for decision-making. PS 4.0

71.0 Use information technology tools. – The student will be able to:

71.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
71.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
71.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
71.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

72.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

72.01 Describe the nature and types of business organizations. SY 1.0
72.02 Explain the effect of key organizational systems on performance and quality.
72.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
72.04 Explain the impact of the global economy on business organizations.

75.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

75.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
75.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
75.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
75.04 Interpret and explain written organizational policies and procedures. ELR 2.0

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Game & Simulation Programming**
Course Number: **8208330**
Course Credit: **1**

Course Description:

This course is focused on students acquiring the appropriate programming skills for rendering a game or simulation product, including program control, conditional branching, memory management, score-keeping, timed event strategies and methodologies, and implementation issues.

48.0 Identify functions of information processing. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.S.3.2; MA.912.A.1.2; MA.912.A.1.1.

48.01 Identify characteristics of high-level languages.
48.02 Identify characteristics of operating systems.
48.03 Identify characteristics of a network.
48.04 Identify needs for software development in the game/simulation industry.
48.05 Identify causes of software development problems in the game/simulation industry.
48.06 Identify most appropriate languages for solving game/simulation industry problems.
48.07 Manipulate data between numbering systems.
48.08 Identify how numeric and non-numeric data are represented in memory.
48.09 Distinguish among integer, fixed-point, and floating-point calculations.

49.0 Test programs. – The student will be able to:

49.01 Develop a plan for testing programs.
49.02 Develop test harnesses for use in program testing.
49.03 Perform debugging activities.
49.04 Distinguish among the different types of program and design errors.
49.05 Evaluate program test results.
49.06 Execute programs and subroutines as they relate to the total application.
49.07 Use trace routines of compilers to assist in program debugging.
49.08 Compile and run programs.
49.09 Create a stable code base.

50.0 Plan program design. – The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1.

50.01 Formulate a plan to determine program specifications individually or in groups.
50.02 Use a graphical representation or pseudo code to represent the structure in a

program or subroutine.
50.03 Design programs to solve problems using problem-solving strategies.
50.04 Prepare proper input/output layout specifications.
50.05 Examine existing utility programs and subroutines for use with other programs.
50.06 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.

51.0 Code programs. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.A.3.1 MA.912.A.3.12; MA.912.G.8.2; MA.912.G.8.3.

51.01 Utilize reference manuals.
51.02 Write programs according to recognized programming standards.
51.03 Write internal documentation statements as needed in the program source code.
51.04 Code programs in high-level languages for game/simulation applications.
51.05 Write code that accesses sequential, random, and direct files.
51.06 Code programs using logical statements (e.g., If-Then-Else, Do...While).
51.07 Enter and modify source code using a program language editor.
51.08 Code routines within programs that validate input data.
51.09 Use the rounding function in calculations within programs.
51.10 Write programs as part of a development team.
51.11 Write event-driven programs.
51.12 Write programs using timed-event strategies and methodologies.
51.13 Write programs that include score keeping.

52.0 Perform program maintenance. – The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1.

52.01 Review requested modification of programs and establish a plan of action.
52.02 Design needed modifications in conformance with established standards.
52.03 Code, test, and debug modifications prior to updating production code.
52.04 Update production programs and documentation with changes.
52.05 Analyze output to identify and annotate errors or enhancements.

53.0 Create and maintain documentation. – The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1.

53.01 Write documentation to assist operators and end-users.
53.02 Follow established documentation standards.
53.03 Update existing documentation to reflect program changes.

54.0 Evaluate assigned game programming tasks. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.G.8.2.

54.01 Estimate the time necessary to write a program.

55.0 Implement enhanced program structures. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.D.8.1; MA.912.D.8.2; MA.912.G.9.1; MA.912.G.7.1; MA.912.G.2.4

55.01 Write programs that include tables or arrays and routines for data entry and lookup.
55.02 Write programs to import/export data from external sources.
55.03 Write programs that use iteration.
55.04 Write routines that incorporate "help" text.
55.05 Write programs that read and write random files.
55.06 Write interactive programs.
55.07 Design screen layouts for use in interactive programs.
55.08 Write programs using object-oriented languages.
55.09 Write programs that include data structures (e.g., stacks, queues, trees, linked lists).
55.10 Write programs that are event-driven to support player goals and actions.

73.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

73.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
73.02 Explain emergency procedures to follow in response to workplace accidents.
73.03 Create a disaster and/or emergency response plan. SHE 2.0

74.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

74.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
74.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
74.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
74.04 Employ mentoring skills to inspire and teach others. LT 5.0

76.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

76.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
76.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
76.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
76.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
76.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
76.06 Identify and exhibit traits for retaining employment. ECD 7.0
76.07 Identify opportunities and research requirements for career advancement. ECD 8.0
76.08 Research the benefits of ongoing professional development. ECD 9.0
76.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

77.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

77.01	Identify and describe the services and legal responsibilities of financial institutions.	FL 2.0
77.02	Describe the effect of money management on personal and career goals.	FL 3.0
77.03	Develop a personal budget and financial goals.	FL3.1
77.04	Complete financial instruments for making deposits and withdrawals.	FL3.2
77.05	Maintain financial records.	FL3.3
77.06	Read and reconcile financial statements.	FL3.4
77.07	Research, compare and contrast investment opportunities.	

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Florida Department of Education
Student Performance Standards

Course Title: **Multi-User Game & Simulation Programming**
Course Number: **8208340**
Course Credit: **1**

Course Description:

This course is focused on students acquiring the appropriate programming skills for rendering a game or simulation product, including program control, conditional branching, score-keeping, timed event strategies and methodologies, and implementation issues specific to multi-user game/simulation products.

56.0 Identify and describe basic network terminology and network security. – The student will be able to:

- 56.01 Define networking and describe the purpose of a network.
- 56.02 Identify the purposes and interrelationships among the major components of networks (e.g., servers, clients, transmission media, network operating system, network boards).
- 56.03 Describe the various types of network topologies.
- 56.04 Describe the various types of game protocols
- 56.05 Demonstrate knowledge of general security concepts.
- 56.06 Develop an awareness of communication security concepts.
- 56.07 Develop an awareness of network infrastructure security.
- 56.08 Describe the various types of multiplayer game architectures
- 56.09 Identify networking and server design requirements for multi-player games
- 56.10 List and describe performance metrics for networked games

57.0 Game configuration. – The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1; SC.912.N.1.2; SC.912.N.1.4; SC.912.N.4.1; SC.912.N.4.2.

- 57.01 Create a window to run a game.
- 57.02 Describe and use appropriate game libraries to run a windowed game.
- 57.03 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available
- 57.04 Troubleshoot problems with computer hardware based on different graphic modes of the game
- 57.05 Describe ethical issues and problems associated with computer games.
- 57.06 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 57.07 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.
- 57.08 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.

57.09 Identify characteristics of operating systems and graphics pipeline
57.10 Distinguish among integer and floating-point bounding box collision calculations...
57.11 Illustrate various configurations of software libraries.

58.0 Test programs. – The student will be able to:

58.01 Develop data for use in program testing.
58.02 Perform debugging activities.
58.03 Distinguish among the different types of program and design errors.
58.04 Evaluate program test results.
58.05 Execute programs and subroutines as they relate to the total application.
58.06 Use trace routines of compilers to assist in program debugging.
58.07 Compile and run programs.

59.0 Plan program design. – The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.3; SC.912.N.1.7.

59.01 Formulate a plan to determine program specifications individually or in groups.
59.02 Use a graphical representation or pseudo code to represent the structure in a program or subroutine.
59.03 Design programs to solve problems using problem-solving strategies.
59.04 Prepare proper input/output layout specifications.
59.05 Examine existing utility programs and subroutines for use with other programs.
59.06 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.

60.0 Create and maintain documentation-The student will be able to:

60.01 Write documentation to assist operators and end-users.
60.02 Follow established documentation standards.
60.03 Update existing documentation to reflect program changes.

61.0 Code programs. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.D.8.1; MA.912.D.8.2; MA.912.D.8.4; MA.912.D.8.5; MA.912.A.10.1; MA.912.G.2.4; MA.912.G.8.6; SC.912.P.12.1; SC.912.P.12.2; SC.912.P.12.3; SC,912.P.12.5; SC.912.P.12.6; SC.912.P.10.18; SC.912.P.10.20; SC.912.P.10.22.

61.01 Utilize reference manuals.
61.02 Write programs according to recognized programming standards.
61.03 Write internal documentation statements as needed in the program source code.
61.04 Code programs in high-level languages for gaming and simulation applications.
61.05 Write code that accesses sequential, indexed sequential, random, and direct files.
61.06 Code programs using logical statements (e.g., if-then-else, do...while).
61.07 Enter and modify source code using a program language editor.
61.08 Code routines within programs that validate input data.
61.09 Use the rounding function in calculations within programs.

61.10 Write programs that display text
61.11 Demonstrate proficiency in drawing lines using graphic primitive functions.
61.12 Demonstrate proficiency in drawing rectangles using graphic primitive functions.
61.13 Demonstrate proficiency in drawing circles using graphic primitive functions.
61.14 Demonstrate proficiency in drawing ellipses using graphic primitive functions.
61.15 Demonstrate proficiency in drawing polygons using graphic primitive functions.
61.16 Write programs that use composite graphic objects
61.17 Write programs that load a bitmap for background
61.18 Write programs that use a sprite handler
61.19 Write programs that use animation
61.20 Write programs that use scrolling
61.21 Write programs that use transparency

62.0 Demonstrate an understanding of operating systems, environments, and platforms. – The student will be able to:

62.01 Identify various types of operating systems/environments for different computer hardware platforms.
62.02 Assess and analyze the functions of different operating systems.
62.03 Distinguish between different types of computer hardware platforms.

63.0 Implement enhanced program structures. – The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1.

63.01 Write programs that include tables or arrays and routines for data entry and lookup.
63.02 Write routines to sort arrays.
63.03 Write programs that sort records in files.
63.04 Write programs to process transactions.
63.05 Write programs that use iteration.
63.06 Write programs that read and write sequential files.
63.07 Write programs that read and write random files.

64.0 Implement multimedia programming. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.G.2.4; MA.912.D.1.1; MA.912.D.1.2; MA.912.D.1.3; SC.912.P.10.1; SC.912.P.10.2; SC.912.P.10.5; SC.912.P.12.4; SC.912.P.12.5; SC.912.P.12.6.

64.01 Demonstrate proficiency in creating multiple composite objects.
64.02 Demonstrate proficiency in moving composite graphics objects.
64.03 Demonstrate proficiency in rotating composite graphics objects by hand.
64.04 Distinguish between flock and flee artificial intelligence algorithms.
64.05 Write programs that use blitting.
64.06 Simulate circular game board.
64.07 Demonstrate proficiency in creating a firing simulation.
64.08 Identify the basic constructs used in bounding box collision algorithm.
64.09 Identify the basic constructs used in truer bounding box collision.
64.10 Demonstrate proficiency in creating a creating a bouncing simulation.
64.11 Simulate pattern based movement.

64.12 Simulate multiple sprites movement.
64.13 Identify the basic constructs used in keyboard input.
64.14 Identify the basic constructs used in mouse input.
64.15 Identify the basic constructs used in double buffering.

65.0 Develop an understanding of programming techniques and concepts. – The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.D.1.1; MA.912.D.2.1; MA.912.D.1.3; MA.912.D.6.1; SC.912.N.1.1.

65.01 Identify the basic constructs used in structured programming.
65.02 Distinguish between top-down and bottom-up design.
65.03 Distinguish between iteration and recursion.
65.04 Evaluate Boolean expressions.
65.05 Distinguish between interpreters and compilers.

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Florida Department of Education
Curriculum Framework

Program Title: **Game/Simulation/Animation Advanced Applications**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	8208400	B082400
CIP Number	0507.039917	0507.039917
Grade Level	9-12, 30, 31	30, 31
Standard Length	1 credits	150 hours
Teacher Certification	BUS ED 1 @2 COMPU SCI 6 COMM ART @7 G TV PRO TEC @ 7 G	BUS ED 1 @2 COMPU SCI 6 COMM ART @7 G TV PRO TEC @ 7 G
CTSO	FBLA BPA	Phi Beta Lambda BPA
SOC Codes (all applicable)	15-1099.13	15-1099.13
Facility Code	212 http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	N/A

Purpose

This program is designed to prepare students for employment as a Game/Simulation Project Manager.

The content includes but is not limited to a capstone opportunity for students to learn and apply principles of project management, team-building, scheduling, coordination and budgeting to create a complete game or simulation product.

Program Structure

This program is a planned sequence of instruction consisting of a single capstone course with one Occupational Completion Point. A student who completes the applicable competencies may exit as an occupational completer.

When offered at the post secondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	DIG0077	Game, Simulation, & Animation Advanced Applications	150 hours	15-1099.13

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8208400	Game, Simulation, & Animation Advanced Applications	1 credit	15-1099.13	2

The Game, Simulation, & Animation Advanced Applications program **must** include the following components:

Pre-Project Planning Conference: The teacher and all team members must participate in a pre-project planning conference, which is essential to designing advanced learning experiences that are appropriate for each individual's learning needs and career interests. It is critical that all parties involved understand and agree on time schedules, expectations, advanced learning applications and evaluation criteria.

Project Criteria: The following criteria shall be met when choosing the Game, Simulation, & Animation Advanced Applications project:

The project must allow experiences that utilize both skills and knowledge directly related to the student's career interests and the Game, Simulation, & Animation Education program in which the student is enrolled or has completed.

The project must provide opportunities for members to experience a high level of interactivity related to the challenges of learning and applying advanced skills.

The project must provide a safe and ethically sound environment with up-to-date facilities and equipment.

Each student must maintain a journal with daily entries describing:

(a) Time spent on the project (log in and log out)
(b) Description of the activity for the period(s)
(c) Materials/equipment/fixtures used
(d) Problems identified
(e) Possible solutions to problems identified

(f) Work accomplished
(g) Solutions attempted
(h) Solutions that failed
(i) Which led to a new problem statement
(j) Video or Still Images of the project as it progresses.
(k) Plans, sketches, drawings, patterns, fixtures or other documentation of components designed or created

Each student will be expected to maintain a portfolio of the project according to the standards contained in this curriculum framework.

A progress report at mid-term will be given by each student to include a written research paper, that describes the area of investigation and an oral presentation to the remainder of the class and instructor or supervising faculty team, on the progress of the project, and all work accomplished. The progress report will be the basis for the mid-term evaluation grade.

A final oral progress report presentation at the end of the course will be given by each student or team that includes:

(a) a review of the portfolio and the journal,
(b) a demonstration of the project's final product
(c) results
(d) problems identified and solutions that worked or did not work, and
(e) a conclusion.

The final progress report will be the basis for the final exam evaluation grade.

When offered for multiple credits, the student should have varied learning experiences in order to provide maximum education exposure.

The course may be supervised by a faculty team consisting of the members of the faculty who will be granting the multiple credit(s) if that is the case.

Project Experience: This component shall provide a match between the student's career interests and a project based situation that will provide exposure to the broad aspects of the selected industry. The assigned tasks should allow a progression and rotation through experiences requiring a variety of knowledge, skills and abilities at increasingly higher levels related to the student's studies and career interests.

Supervision: Teacher-coordinators of the Game, Simulation, & Animation Advanced Applications project must monitor and support learning. Students must also be evaluated a minimum of once per grading period by the teacher-coordinator. The evaluation should assess how well the student is progressing toward goals established by the teacher-coordinator. Portfolio assessment, orchestrated by the teacher-coordinator, is a recommended method of student assessment.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these

occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Florida Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills for secondary students. For postsecondary students, Phi Beta Lambda and BPA are the appropriate student organizations. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns

credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

The PSAV component of this program has no statewide articulation agreement approved by the Articulation Coordinating Committee. However, this does not preclude the awarding of credits by any college through local agreements.

For details on statewide articulation agreements which correlate to programs and industry certifications, refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Complete a skills inventory.
02.0 Demonstrate acceptable work values.
03.0 Demonstrate the ability to identify and solve problems.
04.0 Successfully work as a member of a team.
05.0 Manage time according to a plan.
06.0 Keep acceptable records of progress, problems and solutions.
07.0 Plan, organize and carry out a project plan.
08.0 Manage resources.
09.0 Use tools, materials, and processes in an appropriate and safe manner.
10.0 Demonstrate an understanding of the game and simulation development process.
11.0 Demonstrate appropriate scientific content related to the project.
12.0 Demonstrate appropriate mathematics content related to the project.
13.0 Research content related to the project and document the results.
14.0 Use presentation skills, and appropriate media to describe the progress, results and outcome of the experience.
15.0 Demonstrate competency in the area of expertise related to the Game, Simulation & Animation education program previously completed, that this project is based upon.

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Florida Department of Education
Student Performance Standards

Program Title: **Game/Simulation/Animation Advanced Applications**
PSAV Number: **B082400**

Course Number: DIG0077
Occupational Completion Point – A
Video Game Designer – 150 Hours – SOC Code 15-1099.13

01.0 Complete a safety skills inventory. – The student will be able to:

- 01.01 Practice safety procedures while enrolled in this course.
- 01.02 Demonstrate an understanding of safety and general policies and procedures.

02.0 Demonstrate acceptable project values. – The student will be able to:

- 02.01 Maintain a positive relationship with peers and
- 02.02 Demonstrate adaptive self-management skills.
- 02.03 Rotate through a wide variety of increasingly responsible experiences.
- 02.04 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.

03.0 Demonstrate the ability to identify and solve problems. – The student will be able to:

- 03.01 Prepare a design brief for each step in the project plan to identify constraints or design boundaries.
- 03.02 Identify possible solutions for each design brief.
- 03.03 Complete research and development activities associated with each design brief.
- 03.04 Document problems as they arise.
- 03.05 Prepare a problem statement for any activity that is not successful.
- 03.06 Identify possible solutions for the new problem statement.
- 03.07 Continue the R & D process until workable solutions are found to each problem stated.

04.0 Successfully work as a member of a team. – The student will be able to:

- 04.01 Accept responsibility for specific tasks in a given situation.
- 04.02 Document progress, and provide feedback on work accomplished in a timely manner.
- 04.03 Complete assigned tasks in a timely and professional manner.
- 04.04 Reassign responsibilities when the need arises.
- 04.05 Complete daily tasks as assigned on one's own initiative.

05.0 Manage time according to a plan. – The student will be able to:

- 05.01 Set realistic time frames and schedules.
- 05.02 Keep a written time sheet of work accomplished on a daily basis.
- 05.03 Meet goals and objectives set by the team.
- 05.04 Identify individual priorities.

05.05 Complete a weekly evaluation of accomplishments, and reevaluate goals, objectives and priorities as needed.

06.0 Keep acceptable records of progress problems and solutions. – The student will be able to:

06.01 Develop a record keeping system in the form of a log book to record daily progress.
06.02 Use a project journal to identify problem statement
06.03 Develop a portfolio of work accomplished to include design drawings, research, drawings and plans, storyboards, models, mock-ups and prototypes.

07.0 Plan, organize, and carry out a project plan. – The student will be able to:

07.01 Determine the scope of a project.
07.02 Organize the team according to individual strengths.
07.03 Assign specific tasks within a team.
07.04 Determine project priorities.
07.05 Identify required resources.
07.06 Plan research, design, development, and evaluation activities as required.
07.07 Carry out the project plan to successful completion.

08.0 Manage resources. – The student will be able to:

08.01 Identify required resources for each stage of the project plan.
08.02 Determine the methods needed to acquire needed resources.
08.03 Demonstrate good judgment in the use of resources.
08.04 Recycle and reuse resources where appropriate.
08.05 Demonstrate an understanding of proper legal and ethical treatment of copyrighted material.

09.0 Use tools, materials, and processes in an appropriate and safe manner. – The student will be able to:

09.01 Identify the proper tool for a given job.
09.02 Use tools and machines in a safe manner.
09.03 Adhere to laboratory or job site safety rules and procedures.
09.04 Identify the application of processes appropriate to the task at hand.
09.05 Identify materials appropriate to their application.

10.0 Demonstrate an understanding of the game and simulation development process. – The student will be able to:

10.01 State the goals of the game or simulation clearly.
10.02 Identify and write a plan to achieve each goal.
10.03 Develop a list of materials and content required for each goal.
10.04 Develop a step by step procedure for developing the game or simulation.
10.05 Follow a written procedure.
10.06 Record data from evaluation activities.
10.07 Document conclusions and solutions based on evaluation results, observations and data.

10.08 Document progress using a project log.
10.09 Write an abstract describing the project plan.

11.0 Demonstrate appropriate scientific content related to the project. – The student will be able to:

11.01 Document how types of motion may be described, measured, and predicted.
11.02 Demonstrate how types of force that act on an object and the effect of that force can be described, measured, and predicted.
11.03 Document how the principles of Human Computer Interface (HCI) are incorporated into the project design.
11.04 Demonstrate how science, technology, and society are interwoven and interdependent.

12.0 Demonstrate appropriate mathematics content related to the project. – The student will be able to:

12.01 Identify different ways numbers are represented and used.
12.02 Demonstrate proper use of the number systems.
12.03 Develop effective operations on numbers and the relationships among these operations.
12.04 Use estimation in problem solving and computation.
12.05 Apply theories used in the solution to numbers.
12.06 Use quantities in the real world and uses the measures to solve problems.
12.07 Compare data within systems of measurement (both standard/nonstandard and metric/customary).
12.08 Solve mathematical problems using length, time, weight/mass, temperature, money, perimeter, area, and volume, and estimate the effects of measurement errors on calculations.
12.09 Apply appropriate units and instruments for measurement to achieve the degree of precision and accuracy required in real-world situations.
12.10 Describe, draw, Identify, and analyzes two-and three-dimensional shapes.
12.11 Visualize and illustrate ways in which shapes can be combined, subdivided, and changed.
12.12 Coordinate geometry to locate objects in both two and three dimensions and to describe objects algebraically.
12.13 Describe, analyze, and generalize a wide variety of patterns, relations, and functions.
12.14 Uses expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.
12.15 Uses the tools of data analysis for managing information.
12.16 Identify patterns and makes predictions from an orderly display of data using concepts of probability and statistics.
12.17 Uses statistical methods to make inferences and valid arguments about real-world situations.

13.0 Research content related to the project and document the results.

13.01 Identify the basic research needed to develop the project plan.
13.02 Identify available resources for completing background research required in the project plan.

13.03 Demonstrate the ability to locate resource materials in a library, data base, internet and other research resources.
13.04 Demonstrate the ability to organize information retrieval.
13.05 Demonstrate the ability to prepare a topic outline.
13.06 Write a draft of the research report.
13.07 Edit and proof the research report. Use proper form for a bibliography, footnotes, quotations, and references.
13.08 Prepare an electronically composed research paper in proper form.
13.09 Conduct an alpha and beta evaluation of the project's product.
13.10 Write a report on the evaluations, documenting results, data, observations, and design changes based on the results.

14.0 Use presentation skills, and appropriate media to describe the progress, results and outcomes of the experience.

14.01 Prepare a multi-media presentation on the completed project.
14.02 Make an oral presentation, using multi-media materials.
14.03 Review the presentation, and make changes in the delivery method(s) to improve presentation skills.

15.0 Demonstrate competency in the area of expertise related to the Game, Simulation & Animation education program previously completed that this project is based upon.

15.01 Demonstrate a mastery of the content of the selected subject area.
15.02 Demonstrate the ability to use related technological tools, materials and processes related to the specific program area.
15.03 Demonstrate the ability to apply the knowledge, experience and skill developed in the previous program completion to the successful completion of this demonstration.
15.04 Demonstrate the acquisition of additional knowledge, skill and experience in one area of the selected field of study beyond the performance standards of the initial program standards.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Game, Simulation, & Animation Advanced Applications**
Course Number: **8208400**
Course Credit: **1**

Course Description:

This is a project-based capstone course to provide Game, Simulation & Animation students with the opportunity to develop a project from vision to reality. Students work in teams to research, plan, design, create, test, redesign, test again, and then produce a finished game or simulation product.

16.0 Complete a safety skills inventory. – The student will be able to:

01.03 Practice safety procedures while enrolled in this course.
01.04 Demonstrate an understanding of safety and general policies and procedures.

17.0 Demonstrate acceptable project values. – The student will be able to:

02.05 Maintain a positive relationship with peers and
02.06 Demonstrate adaptive self-management skills.
02.07 Rotate through a wide variety of increasingly responsible experiences.
02.08 Apply basic skills in communications, mathematics, and science appropriate to technological content and learning activities.

18.0 Demonstrate the ability to identify and solve problems. – The student will be able to:

03.08 Prepare a design brief for each step in the project plan to identify constraints or design boundaries.
03.09 Identify possible solutions for each design brief.
03.10 Complete research and development activities associated with each design brief.
03.11 Document problems as they arise.
03.12 Prepare a problem statement for any activity that is not successful.
03.13 Identify possible solutions for the new problem statement.
03.14 Continue the R & D process until workable solutions are found to each problem stated.

19.0 Successfully work as a member of a team. – The student will be able to:

04.06 Accept responsibility for specific tasks in a given situation.
04.07 Document progress, and provide feedback on work accomplished in a timely manner.
04.08 Complete assigned tasks in a timely and professional manner.
04.09 Reassign responsibilities when the need arises.
04.10 Complete daily tasks as assigned on one's own initiative.

20.0 Manage time according to a plan. – The student will be able to:

05.06 Set realistic time frames and schedules.
05.07 Keep a written time sheet of work accomplished on a daily basis.
05.08 Meet goals and objectives set by the team.
05.09 Identify individual priorities.
05.10 Complete a weekly evaluation of accomplishments, and reevaluate goals, objectives and priorities as needed.

21.0 Keep acceptable records of progress problems and solutions. – The student will be able to:

06.04 Develop a record keeping system in the form of a log book to record daily progress.
06.05 Use a project journal to identify problem statement
06.06 Develop a portfolio of work accomplished to include design drawings, research, drawings and plans, storyboards, models, mock-ups and prototypes.

22.0 Plan, organize, and carry out a project plan. – The student will be able to:

07.08 Determine the scope of a project.
07.09 Organize the team according to individual strengths.
07.10 Assign specific tasks within a team.
07.11 Determine project priorities.
07.12 Identify required resources.
07.13 Plan research, design, development, and evaluation activities as required.
07.14 Carry out the project plan to successful completion.

23.0 Manage resources. – The student will be able to:

08.06 Identify required resources for each stage of the project plan.
08.07 Determine the methods needed to acquire needed resources.
08.08 Demonstrate good judgment in the use of resources.
08.09 Recycle and reuse resources where appropriate.
08.10 Demonstrate an understanding of proper legal and ethical treatment of copyrighted material.

24.0 Use tools, materials, and processes in an appropriate and safe manner. – The student will be able to:

09.06 Identify the proper tool for a given job.
09.07 Use tools and machines in a safe manner.
09.08 Adhere to laboratory or job site safety rules and procedures.
09.09 Identify the application of processes appropriate to the task at hand.
09.10 Identify materials appropriate to their application.

25.0 Demonstrate an understanding of the game and simulation development process. – The student will be able to:

10.10 State the goals of the game or simulation clearly.
10.11 Identify and write a plan to achieve each goal.
10.12 Develop a list of materials and content required for each goal.
10.13 Develop a step by step procedure for developing the game or simulation.

10.14 Follow a written procedure.
10.15 Record data from evaluation activities.
10.16 Document conclusions and solutions based on evaluation results, observations and data.
10.17 Document progress using a project log.
10.18 Write an abstract describing the project plan.

26.0 Demonstrate appropriate scientific content related to the project. – The student will be able to:

11.05 Document how types of motion may be described, measured, and predicted.
11.06 Demonstrate how types of force that act on an object and the effect of that force can be described, measured, and predicted.
11.07 Document how the principles of Human Computer Interface (HCI) are incorporated into the project design.
11.08 Demonstrate how science, technology, and society are interwoven and interdependent.

27.0 Demonstrate appropriate mathematics content related to the project. – The student will be able to:

12.18 Identify different ways numbers are represented and used.
12.19 Demonstrate proper use of the number systems.
12.20 Develop effective operations on numbers and the relationships among these operations.
12.21 Use estimation in problem solving and computation.
12.22 Apply theories used in the solution to numbers.
12.23 Use quantities in the real world and uses the measures to solve problems.
12.24 Compare data within systems of measurement (both standard/nonstandard and metric/customary).
12.25 Solve mathematical problems using length, time, weight/mass, temperature, money, perimeter, area, and volume, and estimate the effects of measurement errors on calculations.
12.26 Apply appropriate units and instruments for measurement to achieve the degree of precision and accuracy required in real-world situations.
12.27 Describe, draw, Identify, and analyzes two-and three-dimensional shapes.
12.28 Visualize and illustrate ways in which shapes can be combined, subdivided, and changed.
12.29 Coordinate geometry to locate objects in both two and three dimensions and to describe objects algebraically.
12.30 Describe, analyze, and generalize a wide variety of patterns, relations, and functions.
12.31 Uses expressions, equations, inequalities, graphs, and formulas to represent and interpret situations.
12.32 Uses the tools of data analysis for managing information.
12.33 Identify patterns and makes predictions from an orderly display of data using concepts of probability and statistics.
12.34 Uses statistical methods to make inferences and valid arguments about real-world situations.

28.0 Research content related to the project and document the results.

13.11 Identify the basic research needed to develop the project plan.
13.12 Identify available resources for completing background research required in the project plan.
13.13 Demonstrate the ability to locate resource materials in a library, data base, internet and other research resources.
13.14 Demonstrate the ability to organize information retrieval.
13.15 Demonstrate the ability to prepare a topic outline.
13.16 Write a draft of the research report.
13.17 Edit and proof the research report. Use proper form for a bibliography, footnotes, quotations, and references.
13.18 Prepare an electronically composed research paper in proper form.
13.19 Conduct an alpha and beta evaluation of the project's product.
13.20 Write a report on the evaluations, documenting results, data, observations, and design changes based on the results.

29.0 Use presentation skills, and appropriate media to describe the progress, results and outcomes of the experience.

14.04 Prepare a multi-media presentation on the completed project.
14.05 Make an oral presentation, using multi-media materials.
14.06 Review the presentation, and make changes in the delivery method(s) to improve presentation skills.

30.0 Demonstrate competency in the area of expertise related to the Game, Simulation & Animation education program previously completed that this project is based upon.

15.05 Demonstrate a mastery of the content of the selected subject area.
15.06 Demonstrate the ability to use related technological tools, materials and processes related to the specific program area.
15.07 Demonstrate the ability to apply the knowledge, experience and skill developed in the previous program completion to the successful completion of this demonstration.
15.08 Demonstrate the acquisition of additional knowledge, skill and experience in one area of the selected field of study beyond the performance standards of the initial program standards.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Multimedia Design Technology**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	8212400	B070200
CIP Number	0510.019900	0510.019900
Grade Level	9-12, 30, 31	30, 31
Standard Length	5 credits	1350 hours
Teacher Certification	BUS ED 1 @2 VOE @7 TEACH CBE @7 ELECT DP @7 G BUS DP @ 7 G CLERICAL @7 G SECRETAR @7 G STENOG @4 TEC ELECT @7 G COMPU SCI 6 COMM ART @7 G TV PRO TEC @7 G I ART-TEC @1 @2 TEC ED 1 @2 PRINTING @7 G	BUS ED 1 @2 VOE @7 TEACH CBE @7 ELECT DP @7 G BUS DP @ 7 G CLERICAL @7 G SECRETAR @7 G STENOG @4 TEC ELECT @7 G COMPU SCI 6 COMM ART @7 G TV PRO TEC @7 G I ART-TEC @1 @2 TEC ED 1 @2 PRINTING @7 G
CTSO	FBLA BPA	Phi Beta Lambda BPA
SOC Codes (all applicable)	27-1014	27-1014
Facility Code	212 http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	Mathematics: 10.0 Language: 10.0 Reading: 10.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in digital media, new media, and multimedia positions in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to practical experiences in Web page design, interactive presentation development, testing and production. Specialized skills in multimedia presentations such as video editing, audio features, and simple animation and authoring software are used to produce a variety of interactive multimedia presentations.

Program Structure

This program is a planned sequence of instruction consisting of five Occupational Completion Points in the program when implemented at the postsecondary level. At the secondary level, there are two Occupational Completion Points. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or exit as an occupational completer.

When offered at the post secondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	OTA0040* GRA0005	Information Technology Assistant* Multimedia Production Assistant	150 150	27-1014
B	GRA0006	Multimedia Junior Designer	450	27-1014
C	GRA0007	Multimedia Designer	150	27-1014
D	GRA0008	Multimedia Producer	300	27-1014
E	GRA0009	Multimedia Specialist	150	27-1014

** Note: OTA0040 is a core program.*

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8200320	Keyboarding and Business Skills	.5 credit		2
		AND			
	8200330	Computer and Business Skills	.5 credit		2

OCP	Course Number	Course Title	Length	SOC Code	Level
		OR			
	8209020	Computing for College and Careers	1 credit		2
		OR			
	8207310	Introduction to Information Technology	1 credit		2
	8212430	Multimedia Foundations 1	1 credit	27-1014	2
B	8212440	Multimedia Foundations 2	1 credit	27-1014	2
	8212450	Multimedia Foundations 3	1 credit		2
	8207110	Web Design 1	1 credit		2

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills for secondary students. For postsecondary students, Phi Beta Lambda and BPA are the appropriate student organizations. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 10.0, Language 10.0, and Reading 10.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List

document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of

the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

The PSAV component of this program (B070200) has a statewide articulation agreement approved by the Articulation Coordinating Committee:

1. Graphics Technology AS/AAS (0650040200/1650040200) – 9 credits

For details on articulation agreements which correlate to programs and industry certifications refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

After successfully completing this program, the student will be able to perform the following:

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning though job shadowing, mentoring, e-coaching, etc.
08.0 Demonstrate personal and interpersonal skills appropriate for the workplace.

09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use Technology to apply and enhance communications skills in technical reading, writing.
04.0 Practice quality performance in the learning environment and the workplace.
05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
09.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
11.0 Perform e-mail activities.
12.0 Demonstrate operating systems.
13.0 Develop an awareness of emerging technologies.

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance and enhance personal performance in relation to the workplace. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal and professional ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and

enhance workplace performance.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.

10.0 Demonstrate personal and interpersonal skills and attributes appropriate for the workplace.

11.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.

12.0 Perform e-mail activities.

13.0 Demonstrate operating systems.

14.0 Develop an awareness of emerging technologies.

OR

Introduction to IT Competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.

02.0 Demonstrate Comprehension and communication skills.

03.0 Use technology to enhance the effectiveness of communication skills.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.

05.0 Practice quality performance in the learning environment and the workplace.

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.

11.0 Participate in work-based learning experiences.

12.0 Perform e-mail activities.

13.0 Demonstrate knowledge of different operating systems.

14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW.

15.0 Demonstrate proficiency using HTML commands.

16.0 Demonstrate proficiency in page design applicable to the WWW.

17.0 Demonstrate proficiency using specialized web design software.

18.0 Develop an awareness of the information technology industry.

19.0 Develop an awareness of microprocessors and digital computers.

20.0 Develop an awareness of programming languages.

21.0 Develop an awareness of emerging technologies.

22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model.

23.0 Demonstrate proficiency using common software applications.
24.0 Demonstrate proficiency using specialized software applications.

Program Standards

25.0 Demonstrate knowledge of presentation production issues.
26.0 Demonstrate proficiency in using presentation software and equipment.
27.0 Demonstrate proficiency in Web page design applicable to the WWW.
28.0 Demonstrate an understanding of HTML commands.
29.0 Demonstrate proficiency in using a WYSIWG editor, Web design, or Web animation for Web page design.
30.0 Demonstrate proficiency in using presentation software and equipment to produce a complex presentation.
31.0 Demonstrate proficiency using video editing software and equipment.
32.0 Demonstrate Proficiency in using presentation software and equipment to produce a presentation suitable for streaming via the Web.
33.0 Develop proficiency in using authoring software.
34.0 Participate in work-based learning experiences.
35.0 Apply job readiness, career planning and job seeking skills to obtain personal and professional goals.
36.0 Demonstrate language arts knowledge and skills.
37.0 Demonstrate mathematics knowledge and skills.
38.0 Demonstrate science knowledge and skills.
39.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
40.0 Solve problems using critical thinking skills, creativity and innovation.
41.0 Use information technology tools.
42.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
43.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
44.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
45.0 Describe the importance of professional ethics and legal responsibilities.
46.0 Explain the importance of employability skill and entrepreneurship skills.
47.0 Demonstrate personal money-management concepts, procedures, and strategies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Multimedia Design Technology**
PSAV Number: **B070200**

Course Number: OTA0040
Occupational Completion Point – A
Multimedia Production Assistant – 150 Hours – SOC Code 15-1041

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Demonstrate basic file management skills.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 03.01 Select and use word processing software and accompanying features to enhance written business communications.
- 03.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.
- 03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

07.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
07.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
07.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
07.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

08.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

08.01 Accept constructive criticism.
08.02 Apply appropriate strategies to manage and resolve conflict in work situations.
08.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

09.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
09.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic file management skills.
01.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

02.01 Take notes, organize, summarize, and paraphrase ideas and details.
02.02 Accurately follow written and oral instructions.
02.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
03.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

04.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
04.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

05.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
05.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
05.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
06.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
06.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

07.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
07.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

07.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

08.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
08.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
08.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
08.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
08.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
08.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
08.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
08.08 Build mentor relationships with local professionals in the industry.

09.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

09.01 Accept constructive criticism.
09.02 Apply appropriate strategies to manage and resolve conflict in work situations.
09.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

10.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

11.0 Perform e-mail activities. – The student will be able to:

11.01 Describe e-mail capabilities and functions.
11.02 Use the Internet to perform e-mail activities.

12.0 Demonstrate operating systems. – The student will be able to:

12.01 Identify operating system file naming conventions.

12.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
12.03 Demonstrate a working knowledge of standard file formats.
12.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

13.0 Develop an awareness of emerging technologies. – The student will be able to:

13.01 Compare and contrast various methods of evaluation for emerging technologies.
13.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
13.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance-The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic computer file management skills.
01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills-The student will be able to:

02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
02.02 Write clear and well-organized research papers, integrating a variety of information.
02.03 Prepare and deliver an oral report with appropriate materials to the class
02.04 Participate in large group discussions as a member and/or a leader.
02.05 Take notes, organize, summarize, and paraphrase ideas and details.
02.06 Accurately follow written and oral instructions.
02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills-The student will be able to:

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles-The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace-The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance-The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance-The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals-The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals-The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up).
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace-The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance-The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities–The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems–The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies-The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Introduction to Information Technology competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance — The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills — The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

- 03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
- 03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles — The student will be able to:

- 04.01 Explore, design, implement, and evaluate organizational structures and cultures.
- 04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
- 04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace — The student will be able to:

- 05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
- 05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance — The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance — The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals — The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals — The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace — The student will be able to:

10.01 Accept constructive criticism.

10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences — The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.
12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.
12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the www – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).

14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using html commands – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the www – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software - The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry - The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers - The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages - The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies - The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the open systems interface (osi) model - The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications - The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail,

presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications - The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

Course Number: GRA0005
Occupational Completion Point – A
Multimedia Production Assistant – 150 Hours – SOC Code 27-1014

25.0 Demonstrate knowledge of presentation production issues—The student will be able to:

25.01 Identify characteristics of various types of presentations (informing, selling, teaching, entertaining)
25.02 Identify presentation materials (e.g.. handouts, seminar notebooks, business cards, coupons, etc.) and presentation marketing mediums (ex. print media such as newspaper, magazines; TV; movies; computer presentations; interactive CD ROM; kiosks, and Web pages, etc.)
25.03 Identify design characteristics (fonts, size and styles, backgrounds, etc.) that are suited for each type of presentation format and material.
25.04 Demonstrate knowledge of copyright laws including copyright statue, disclaimers, and filing procedures.
25.05 Research and identify skills needed for career positions in multimedia
25.06 Demonstrate an understanding of graphic and other file formats (e.g., EPS, TIFF, JPEG, ASCII, MPEG, MIDI, AVI, WAV, etc.) and knowledge of image size when scanning and saving files for use in different presentation types (Web, computer, print, etc.)
25.07 Demonstrate knowledge of presentation vocabulary/terms.

26.0 Demonstrate proficiency in using presentation software and equipment – The student will be able to:

26.01 Produce a presentation that includes music, animation, and digital photography and present it using a projection system.

36.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

36.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
36.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
36.03 Present information formally and informally for specific purposes and audiences. AF2.9

37.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

- 37.01 Demonstrate knowledge of arithmetic operations. AF3.2
- 37.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
- 37.03 Construct charts/tables/graphs using functions and data. AF3.5

38.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

- 38.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
- 38.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

Course Number: GRA0006
Occupational Completion Point – B
Multimedia Junior Designer – 450 Hours – SOC Code 27-1014

27.0 Demonstrate proficiency in web page design applicable to the WWW—The student will be able to:

- 27.01 Determine the objectives and the audience for Web pages.
- 27.02 Identify design strategies to reach and keep an audience
- 27.03 Use storyboarding to plan a Web site.
- 27.04 Create styles and other design elements (e.g. backgrounds, colors, fonts, buttons, etc.)

28.0 Demonstrate an understanding of HTML commands—The student will be able to:

- 28.01 Compare WYSIWG editors to non-WYSIWG coding.
- 28.02 Interpret HTML coding on an existing Web page.
- 28.03 Use HTML commands to write a Web page.

29.0 Demonstrate proficiency in using a WYSIWG editor, web design, or web animation software for web page design—The student will be able to:

- 29.01 Create Web pages for publication.
- 29.02 Apply style sheets for consistent Web site design.
- 29.03 Format text for Web pages (e.g., font families, sizes)
- 29.04 Create and edit images, photographs for Web pages using digital imaging software (e.g. ImageReady in Photoshop).
- 29.05 Insert created buttons into a Web page and test for accuracy
- 29.06 Create navigational links.
- 29.07 Insert audio files into a Web page.
- 29.08 Create, edit and integrate video files into a Web page.
- 29.09 Create, edit and integrate animation files into a Web page.
- 29.10 Create Meta commands and key words for search engines.
- 29.11 Optimize page size for effective downloading to browsers.

29.12 Create and incorporate a form in a Web page.
29.13 Edit and test links for accuracy and validity.
29.14 Optimize images to make them “Web ready”.
29.15 Demonstrate knowledge of image formats related to photos and graphics on the Internet (e.g. Graphic formats (Tiff & EPS), Web formats (JEPG, GIF, PNG), etc.
29.16 Demonstrate an understanding of photograph compression factors such as transmission speed, color reduction, and browser support.
29.17 Save and export a photograph to the Web in the format best for image quality and file size.
29.18 Demonstrate knowledge of the terms and vocabulary used with the animation process, animation software, and types of animation (e.g. 2D vs. 3D, Cel and Keyframe animation).

39.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

39.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
39.02 Locate, organize and reference written information from various sources. CM 3.0
39.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
39.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
39.05 Apply active listening skills to obtain and clarify information. CM 7.0
39.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
39.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

40.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

40.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
40.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
40.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
40.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

41.0 Use information technology tools. – The student will be able to:

41.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
41.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
41.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
41.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

42.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

42.01 Describe the nature and types of business organizations. SY 1.0
42.02 Explain the effect of key organizational systems on performance and quality.
42.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
42.04 Explain the impact of the global economy on business organizations.

43.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

43.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
43.02 Explain emergency procedures to follow in response to workplace accidents.
43.03 Create a disaster and/or emergency response plan. SHE 2.0

44.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

44.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
44.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
44.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
44.04 Employ mentoring skills to inspire and teach others. LT 5.0

45.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

45.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
45.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
45.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
45.04 Interpret and explain written organizational policies and procedures. ELR 2.0

46.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

46.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
46.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
46.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
46.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
46.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
46.06 Identify and exhibit traits for retaining employment. ECD 7.0
46.07 Identify opportunities and research requirements for career advancement. ECD 8.0
46.08 Research the benefits of ongoing professional development. ECD 9.0
46.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

47.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

47.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
47.02 Describe the effect of money management on personal and career goals. FL 3.0
47.03 Develop a personal budget and financial goals. FL3.1
47.04 Complete financial instruments for making deposits and withdrawals. FL3.2
47.05 Maintain financial records. FL3.3
47.06 Read and reconcile financial statements. FL3.4
47.07 Research, compare and contrast investment opportunities.

Course Number: GRA0007
Occupational Completion Point – C
Multimedia Designer – 150 Hours – SOC Code 27-1014

30.0 Demonstrate proficiency in using presentation software and equipment to produce a complex presentation - The student will be able to:

30.01 Using presentation software, create a multimedia presentation that incorporates shot and edited video, animation, music, narration and adheres to good design principles, use of transitions, and effective message conveyance.
30.02 Demonstrate knowledge of the roles and responsibilities of a multimedia production team (e.g. project manager, creative or design director, content experts, writers, graphic designers, animators, sound designers, videographer, interface designers/programmers, etc.)
30.03 Collaborate with team members to plan, edit, evaluate, and present a multimedia presentation.

31.0 Demonstrate proficiency using video editing software and equipment – The student will be able to:

31.01 Demonstrate knowledge of video and sound editing vocabulary, terms, and acronyms.
31.02 Demonstrate knowledge of non-linear editing software (NLEs) and compare the strengths and weaknesses of these programs.
31.03 Identify components of non-linear video editing equipment
31.04 Set-up non-linear video editing equipment
31.05 Compare offline to “real time” video editing
31.06 Use storyboarding to plan a short nonlinear video project that includes existing video footage with a title, transitions, background sound, voice-over, animation, and rolling credits.
31.07 Create and edit a movie using video editing software that includes existing video footage with a title, transitions, background sound, voice-over, and rolling credits and output to video.
31.08 Collaborate with team members to create a short movie utilizing good lighting and sound: plan, shoot, and edit video footage as a team.
31.09 Using a video editor, create animated GIFs.
31.10 Collaborate with team members to plan, edit, and shoot video footage utilizing advanced video editing techniques and output to video.
31.11 Discuss the use of batch processing and project trimming

31.12 Plan, create, edit and present a short nonlinear QuickTime movie with title, transitions, sub and virtual clips, sound, background music, voice-over, and credits.

Course Number: GRA0008
Occupational Completion Point – D
Multimedia Producer – 300 Hours – SOC Code 27-1014

32.0 Demonstrate proficiency in using presentation software and equipment to create a presentation suitable for streaming via the Web –The student will be able to:

32.01 Create a self-running presentation with synchronized audio, convert presentation slides into streaming ASF files for use on the Web.

33.0 Develop proficiency in using authoring software—The student will be able to:

33.01 Plan interactive projects for use in a kiosk, CD, DVD, E-merchandizing, computer-based presentation or training or corporate presentation
33.02 Use authoring software to create an interactive project for use in a kiosk, CD, DVD, merchandizing application, computer-based training or corporate presentation.
33.03 Have the created interactive project evaluated and tested by users and make modifications to improve the project.
33.04 Collaborate with team members to plan, edit, evaluate, and present a multimedia interactive presentation or product.

34.0 Participate in work-based learning experiences—The student will be able to:

34.01 Participate in work-based learning experiences in a multimedia environment.

Course Number: GRA0009
Occupational Completion Point – E
Multimedia Specialist – 150 Hours – SOC Code 27-1014

35.0 Apply job readiness, career planning and job seeking skills to obtain personal and professional goals—The student will be able to:

35.01 Create a digital resume
35.02 Create a digital portfolio
35.03 Market multimedia production skills for employment

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Keyboarding and Business Skills**
Course Number: **8200320**
Course Credit: **.5**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental word processing applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society.

This course, along with Computer and Business Skills is equivalent to Computing for College and Careers. Students should complete this course before enrolling in Computer and Business Skills.

10.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 10.01 Develop keyboarding skills to enter and manipulate text and data.
- 10.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 10.03 Demonstrate basic file management skills.

11.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 11.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 11.02 Write clear and well-organized research papers, integrating a variety of information.
- 11.03 Prepare and deliver an oral report with appropriate materials to the class
- 11.04 Participate in large group discussions as a member and/or a leader.
- 11.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 11.06 Accurately follow written and oral instructions.
- 11.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

12.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 12.01 Select and use word processing software and accompanying features to enhance written business communications.
- 12.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.

12.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

13.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

13.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
13.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
13.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

14.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

14.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
14.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

15.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

15.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
15.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
15.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

16.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

16.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
16.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.

16.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
16.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

17.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

17.01 Accept constructive criticism.
17.02 Apply appropriate strategies to manage and resolve conflict in work situations.
17.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

18.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
18.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer and Business Skills**
Course Number: **8200330**
Course Credit: **.5**

Course Description:

This course is designed to introduce students to the basic skills and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

This course, along with Keyboarding and Business Skills is equivalent to Computing for College and Careers. Students should complete Keyboarding and Business Skills before enrolling in this course.

14.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 14.01 Develop keyboarding skills to enter and manipulate text and data.
- 14.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 14.03 Identify and describe communications and networking systems used in workplace environments.
- 14.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 14.05 Demonstrate basic file management skills.
- 14.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
- 14.07 Describe ethical issues and problems associated with computers and information systems.
- 14.08 Apply ergonomic principles applicable to the configuration of computer workstations.

15.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

- 15.01 Take notes, organize, summarize, and paraphrase ideas and details.
- 15.02 Accurately follow written and oral instructions.
- 15.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

16.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

16.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
16.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
16.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

17.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

17.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
17.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

18.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
18.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
18.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

19.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

19.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
19.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
19.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

20.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

20.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
20.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

20.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

21.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

21.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
21.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
21.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
21.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
21.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
21.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
21.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
21.08 Build mentor relationships with local professionals in the industry.

22.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

22.01 Accept constructive criticism.
22.02 Apply appropriate strategies to manage and resolve conflict in work situations.
22.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

23.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

23.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

24.0 Perform e-mail activities. – The student will be able to:

24.01 Describe e-mail capabilities and functions.
24.02 Use the Internet to perform e-mail activities.

25.0 Demonstrate operating systems. – The student will be able to:

25.01 Identify operating system file naming conventions.

25.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
25.03 Demonstrate a working knowledge of standard file formats.
25.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

26.0 Develop an awareness of emerging technologies. – The student will be able to:

26.01 Compare and contrast various methods of evaluation for emerging technologies.
26.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
26.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computing for College and Careers**
Course Number: **8209020**
Course Credit: **1**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society. This also includes proficiency with computers using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance-The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Demonstrate basic computer file management skills.
- 01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.07 Describe ethical issues and problems associated with computers and information systems.
- 01.01 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills-The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills-The student will be able to:

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles-The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace-The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance-The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance-The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals-The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals-The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up).
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace-The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance-The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities–The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems–The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies-The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Introduction to Information Technology**
Course Number: **8207310**
Course Credit: **1**

Course Description:

This course is designed to provide an introduction to information technology concepts and careers as well as the impact information technology has on the world, people, and industry and basic web design concepts. The content includes information technology career research; operating systems and software applications; electronic communications including e-mail and Internet services; basic HTML, DHTML, and XML web commands and design; and emerging technologies and web page design.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance — The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills — The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles — The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace — The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance — The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance — The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals — The student will be able to:

- 08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals — The student will be able to:

- 09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
- 09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
- 09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
- 09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
- 09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace — The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences — The student will be able to:

- 11.01 Participate in work-based learning experiences in an information technology environment.
- 11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities – The student will be able to:

- 12.01 Describe e-mail capabilities and functions.
- 12.02 Identify components of an e-mail message.
- 12.03 Identify the components of an e-mail address.
- 12.04 Identify when to use different e-mail options.
- 12.05 Attach a file to an e-mail message.
- 12.06 Forward an e-mail message.

12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the Internet, intranet, and the WWW – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using HTML commands – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the WWW – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software - The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry - The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers - The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages - The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies - The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the open systems interface (OSI) model - The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications - The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications - The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Multimedia Foundations 1**
Course Number: **8212430**
Course Credit: **1**

Course Description:

This course is designed to provide a basic understanding of fundamentals of multimedia. Students learn to plan and create presentations that incorporate scanned images, and images created in various formats and mediums.

25.0 Demonstrate knowledge of presentation production issues—The student will be able to:

- 25.01 Identify characteristics of various types of presentations (informing, selling, teaching, and entertaining).
- 25.02 Identify presentation materials (e.g. handouts, seminar notebooks, business cards, coupons, etc.) and presentation marketing mediums (ex. print media such as newspaper, magazines; TV; movies; computer presentations; interactive CD ROM; kiosks, and Web pages, etc.).
- 25.03 Identify design characteristics (fonts, size and styles, backgrounds, etc.) that are suited for each type of presentation format and material.
- 25.04 Demonstrate knowledge of copyright laws including copyright statue, disclaimers, and filing procedures.
- 25.05 Research and identify skills needed for career positions in multimedia.
- 25.06 Demonstrate an understanding of graphic and other file formats (e.g., EPS, TIFF, JPEG, ASCII, MPEG, MIDI, AVI, WAV, etc.) and knowledge of image size when scanning and saving files for use in different presentation types (Web, computer, print, etc.)
- 25.07 Demonstrate knowledge of presentation vocabulary/terms.

26.0 Demonstrate proficiency in using presentation software and equipment- The student will be able to:

- 26.01 Produce a presentation that includes music, animation, and digital photography and present it using a projection system.

36.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

- 36.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
- 36.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
- 36.03 Present information formally and informally for specific purposes and audiences. AF2.9

37.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

- 37.01 Demonstrate knowledge of arithmetic operations. AF3.2
- 37.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4

37.03 Construct charts/tables/graphs using functions and data. AF3.5

38.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

38.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1

38.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Multimedia Foundations 2**
Course Number: **8212440**
Course Credit: **1**

Course Description:

This course is designed to provide a basic understanding of Web page layout and integration of video and animation into Web pages. Special emphasis is placed on good design, proper usage of typography and images for delivery on the Internet.

27.0 Demonstrate proficiency in web page design applicable to the WWW— The student will be able to:

- 27.01 Determine the objectives and the audience for Web pages.
- 27.02 Identify design strategies to reach and keep an audience
- 27.03 Use storyboarding to plan a Web site.
- 27.04 Create styles and other design elements (e.g. backgrounds, colors, fonts, buttons, etc.)

28.0 Demonstrate an understanding of HTML commands - The student will be able to:

- 28.01 Compare WYSIWG editors to non-WYSIWG coding.
- 28.02 Interpret HTML coding on an existing Web page.
- 28.03 Use HTML commands to write a Web page.

29.0 Demonstrate proficiency in using a WYSIWG editor, web design, or web animation software for web page design - The student will be able to:

- 29.01 Create Web pages for publication.
- 29.02 Apply style sheets for consistent Web site design.
- 29.03 Format text for Web pages (e.g., font families, sizes)
- 29.04 Create and edit images, photographs for Web pages using digital imaging software (e.g. ImageReady in Photoshop).
- 29.05 Insert created buttons into a Web page and test for accuracy.
- 29.06 Create navigational links.
- 29.07 Insert audio files into a Web page.
- 29.08 Create, edit and integrate video files into a Web page.
- 29.09 Create, edit and integrate animation files into a Web page.

39.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

- 39.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
- 39.02 Locate, organize and reference written information from various sources. CM 3.0

39.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
39.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
39.05 Apply active listening skills to obtain and clarify information. CM 7.0
39.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
39.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

40.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

40.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
40.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
40.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
40.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

41.0 Use information technology tools. – The student will be able to:

41.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
41.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
41.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
41.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

42.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

42.01 Describe the nature and types of business organizations. SY 1.0
42.02 Explain the effect of key organizational systems on performance and quality.
42.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
42.04 Explain the impact of the global economy on business organizations.

45.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

45.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
45.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
45.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
45.04 Interpret and explain written organizational policies and procedures. ELR 2.0

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Multimedia Foundations 3**
Course Number: **8212450**
Course Credit: **1**

Course Description:

This course is designed to FURTHER provide a basic understanding of Web page layout and integration of video and animation into Web pages. Special emphasis is placed on good design, proper usage of typography and images for delivery on the Internet.

29.0 Demonstrate proficiency in using a WYSIWG editor, web design, or web animation software for web page design – The student will be able to:

- 29.10 Create Meta commands and key words for search engines.
- 29.11 Optimize page size for effective downloading to browsers.
- 29.12 Create and incorporate a form in a Web page.
- 29.13 Edit and test links for accuracy and validity.
- 29.14 Optimize images to make them "Web ready".
- 29.15 Demonstrate knowledge of image formats related to photos an graphics on the Internet (e.g. Graphic formats (Tiff & EPS), Web formats (JEPG, GIF, PNG), etc.).
- 29.16 Demonstrate an understanding of photograph compression factors such as transmission speed, color reduction, and browser support.
- 29.17 Save and export a photograph to the Web in the format best suited for image quality and file size.
- 29.18 Demonstrate knowledge of the terms and vocabulary used with the animation process, animation software, and types of animation (e.g. 2D vs. 3D, Cel and Keyframe animation).

43.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

- 43.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
- 43.02 Explain emergency procedures to follow in response to workplace accidents.
- 43.03 Create a disaster and/or emergency response plan. SHE 2.0

44.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

- 44.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
- 44.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
- 44.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0

44.04 Employ mentoring skills to inspire and teach others. LT 5.0

46.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

46.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
46.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
46.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
46.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
46.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
46.06 Identify and exhibit traits for retaining employment. ECD 7.0
46.07 Identify opportunities and research requirements for career advancement. ECD 8.0
46.08 Research the benefits of ongoing professional development. ECD 9.0
46.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

47.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

47.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
47.02 Describe the effect of money management on personal and career goals. FL 3.0
47.03 Develop a personal budget and financial goals. FL3.1
47.04 Complete financial instruments for making deposits and withdrawals. FL3.2
47.05 Maintain financial records. FL3.3
47.06 Read and reconcile financial statements. FL3.4
47.07 Research, compare and contrast investment opportunities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Web Design 1**
Course Number: **8207110**
Course Credit: **1**

Course Description:

This course is designed to provide a basic overview of the Internet, Intranet, and WWW. The content includes operating systems; basic HTML commands; navigation of the Internet, Intranet, and Web; and Web page design.

01.0 Participate in work-based learning experiences — The student will be able to:

- 01.01 Participate in work-based learning experiences in a Web Design environment.
- 01.02 Discuss the use of technology in a Web Design Services (Web Design) environment.
- 01.03 Compare and contrast the software applications used in a Web Design Services (Web Design) environment.

02.0 Perform e-mail activities — The student will be able to:

- 02.01 Describe e-mail capabilities and functions.
- 02.02 Create and send e-mail messages with attachments.
- 02.03 Reply to and forward e-mail messages.
- 02.04 Organize and manage e-mail messages.
- 02.05 Utilize all applicable e-mail options and functions.
- 02.06 Use the Internet to perform e-mail activities.
- 02.07 Define the standards used by Internet/Intranet e-mail (e.g., pop3, mime).
- 02.08 Describe the issues involved in sending and receiving documents as e-mail attachments.
- 02.09 Identify privacy issues in the employee/employer relationship (e.g., avoid libel, spam, personal usage).

03.0 Demonstrate proficiency using operating systems — The student will be able to:

- 03.01 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
- 03.02 Describe the difference between relative and absolute path commands.
- 03.03 Demonstrate a working knowledge of standard file formats.
- 03.04 Demonstrate proficiency with help references.

04.0 Perform decision making activities - The student will be able to:

- 04.01 Determine work priorities.
- 04.02 Evaluate and select appropriate software packages to complete assigned tasks.
- 04.03 Evaluate information to be used and choose relevant material.
- 04.04 Determine the audience.
- 04.05 Compare and select appropriate multimedia tools.

05.0 Demonstrate proficiency navigating the Internet, intranet, and the WWW — The student will be able to:

- 05.01 Identify and describe Web terminology.
- 05.02 Describe the history of the Internet and intranet.
- 05.03 Describe the difference between a client and a server.
- 05.04 Describe the difference between the Internet, intranet, and WWW.
- 05.05 Describe the different methods by which information may be accessed on the Internet/intranet (e.g., browser, FTP, gopher, telnet, veronica).
- 05.06 List the available resources and services on the Internet (e.g., electronic commerce, personal, government, business, etiquette, education, distance learning).
- 05.07 Locate information on the Internet/intranet using a Web browser.
- 05.08 Copy information from the Internet/intranet, save, and print using a Web browser.
- 05.09 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
- 05.10 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
- 05.11 Identify and use search engines to locate information.
- 05.12 Describe the various ways of communicating on the Internet/Intranet (e.g., e-mail, forums, IRC, CHAT, Listserv, Usenet, MOOs, etc.).
- 05.13 Describe and observe Internet/intranet ethics and copyright laws.
- 05.14 Identify methods to protect personal copyright.

06.0 Demonstrate proficiency using HTML commands — The student will be able to:

- 06.01 Identify elements of a Web page.
- 06.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
- 06.03 Define basic HTML terminology.
- 06.04 Analyze HTML source code developed by others.
- 06.05 Create a Web page using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
- 06.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
- 06.07 Add graphics to Web pages.
- 06.08 Edit and test HTML documents for accuracy and validity.
- 06.09 Use basic functions of HTML editors and converters.
- 06.10 Use basic functions of WYSIWYG editors.

07.0 Demonstrate proficiency in page design applicable to the WWW — The student will be able to:

- 07.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
- 07.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
- 07.03 Identify and convert graphic formats.
- 07.04 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD ROMS).

07.05 Use image design software to create and edit images.

08.0 Develop an awareness of Internet/intranet tools - The student will be able to:

08.01 Describe the various hardware components used on the Internet/Intranet.
08.02 Demonstrate the use of compression programs.
08.03 Demonstrate the use of backups.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Geospatial/Geographic Information Systems (GIS) Technology**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	8600200	T860020
CIP Number	0507.030614	0507.030614
Grade Level	9-12, 30, 31	30, 31
Standard Length	4 credits	600 hours
Teacher Certification	BUS ED 1 @2 COMPU SCI 6 TEC ED 1 @2 TEC EN AID @7 G *** See Note Below**	BUS ED @2 COMPU SCI 6 TEC ED @2 TEC EN AID @7 G *** See Note Below**
CTSO	Florida Technology Student Association (FL-TSA)	SkillsUSA
SOC Codes (all applicable)	15-1099.07	15-1099.07
Facility Code	[212], http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	Math 10 Language 10 Reading 10

***Special Note**-- Any Vocational Coverage suitable for Secondary or PSAV implementation accompanied by industry-recognized GIS Technician certification in accordance with FS 1012.39*

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic benchmarks and relevant technical knowledge and skills needed to prepare for further education and careers in the Government and Public Administration career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Government and Public Administration career cluster.

This program is designed to prepare students for employment as a GIS Technology Assistant or a GIS Technician. Students are introduced to the concepts of Geospatial/Geographic Information System (GIS) and Remote Sensing (RS) Technology — an organized collection of computer hardware, specialized software, and geographic data designed to efficiently capture, store, update, manipulate, analyze, and display all forms of geographically referenced (spatial) information. Students will research and learn detailed information about global and local matters related to political, environmental, commercial, and other areas, through the use of specialized geospatial tools and products.

This program offers a broad foundation of core knowledge, transferable skills, and applications to prepare students for future careers as skilled GIS/RS professionals. As GIS is a rapidly developing field, GIS professionals are in high demand and this program will prepare students for entry into the field. The content of this program includes the development of the following computer skills and concepts: computer application skills (e.g., word processing, spreadsheet, presentation, and desktop publishing), Internet browser applications, computer programming, advanced web tools, and basic concepts of relational databases and the tools to use them. Additionally, this program stresses understanding and demonstration of GIS and RS concepts, project management strategies, applications of geographic data elements and remotely sensed data, visualizations of spatial data, data inventory management, demographic and economic data analysis, data collection methods and techniques, and extensive exploration of GIS/RS careers and job opportunities.

Program Structure

This program is a planned sequence of instruction consisting of two occupational completion points.

When offered at the postsecondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

This program is a planned sequence of instruction meant to complement other information technology and technology education frameworks. The program consists of four courses, offering two Occupational Completion Points (OCPs). Students enrolling in this program must be computer literate. This literacy can be achieved by completing one credit of the Business Technology Education core. This includes Computing for College & Careers (8209020) or Introduction to Information Technology (8207310). A student who completes the applicable competencies at any occupational completion point may either continue with the training program or exit as an occupational completer.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	GIS0090	GIS Technician Assistant	300 Hours	15-1099.07
B	GIS0091	GIS Technician	300 Hours	15-1099.07

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8600260 8600270	Introduction to GIS/RS Technology Essential GIS/RS Tools & Processes	1 credit 1 credit	15-1099.07	2
B	8600280 8600290	GIS/RS Analysis & Modeling Advanced GIS/RS Applications	1 credit 1 credit	15-1099.07	2

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Laboratory activities are an integral part of this program and include the use of keyboarding systems, computers, and peripheral equipment.

Special Notes

Program Implementation

This program emphasizes the development of abilities and/or awareness necessary to function in a highly technological society. The use of cooperative learning groups is recommended. By learning and practicing group process skills, students will be prepared to work "together" in real work situations. Program graduates will develop enhanced self-esteem as well as the problem-solving and teamwork skills necessary to succeed in careers and postsecondary education. Students will gain knowledge about career paths, have access to business role models, and have choices they would not otherwise have.

The Geospatial/Geographic Information Systems (GIS) Technology program places a strong emphasis on workplace learning. Shadowing and mentoring experiences with GIS professionals along with on-site trips to local businesses connect classroom learning to the workplace. In-class guest speakers bring the real world into the classroom.

Although a variety of GIS software applications and utilities are available in industry, the standards specified in this program focus on the underlying functions and associated competencies in alignment with the STARS program (www.digitalquest.com).

Career and Technical Student Organization (CTSO)

Florida Technology Student Association (FL-TSA) and SkillsUSA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 10, Language 10, and Reading 10. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and

special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance benchmarks associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

For details on articulation agreements which correlate to programs and industry certifications refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

01.0 Perform general computer application activities.
02.0 Understand the history, societal implications, underlying theories, and industry applications of GIS technology.
03.0 Understand map types, purposes, and information they depict.
04.0 Demonstrate an understanding of coordinate systems, projections, scale, multi-spectral imagery, and other concepts integral to geographic information systems.
05.0 Create, change, and manipulate data used to create a map.
06.0 Layout and print maps.
07.0 Design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals
08.0 Customize the display of geospatial data.

09.0 Manage, query, and symbolize geospatial data.
10.0 Create a geospatial model.
11.0 Create, change, and manipulate remotely sensed image data.
12.0 Create surface models of spatial data to map distance.
13.0 Demonstrate density models of spatial data.
14.0 Demonstrate different surface interpolation methods.
15.0 Demonstrate different surface analysis methods.
16.0 Use different statistical methods in raster analysis.
17.0 Interpret different types of spatial data used in 3D visualization and analysis.
18.0 Create network datasets using existing shapefiles and geodatabases.
19.0 Create a 3D map using a GPS unit for use in a class wide project.
20.0 Create an extensive campus-based geospatial project.
21.0 Demonstrate language arts knowledge and skills.
22.0 Demonstrate mathematics knowledge and skills.
23.0 Demonstrate science knowledge and skills.
24.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
25.0 Solve problems using critical thinking skills, creativity and innovation.
26.0 Use information technology tools.
27.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
28.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
29.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
30.0 Describe the importance of professional ethics and legal responsibilities.
31.0 Explain the importance of employability skill and entrepreneurship skills.
32.0 Demonstrate personal money-management concepts, procedures, and strategies.

2011 – 2012

Florida Department of Education
Student Performance Benchmarks

Program Title: **Geospatial/Geographic Information Systems (GIS) Technology**
PSAV Number: **T860020**

Course Number: GIS0090
Occupational Completion Point: A
GIS Technician Assistant – 300 Hours – SOC Code 15-1099.07

01.0 Perform general computer application activities. The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Demonstrate basic computer file management skills.
- 01.03 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.04 Use spreadsheet, presentation software, and integrated software packages to enhance communication.
- 01.05 Use computer networks (e.g., Internet, on-line databases) to facilitate collaborative or individual learning and communication.
- 01.06 Use computers to access, retrieve, organize, process, maintain, interpret, and evaluate data and information.

02.0 Understand the history, societal implications, underlying theories, and industry applications of GIS technology. The student will be able to:

- 02.01 Discuss the history and societal implications of mapping, GIS, and remote sensing.
- 02.02 Describe the underlying theories of GIS and remote sensing technologies.
- 02.03 Identify industry applications for GIS technology.

03.0 Understand map types, purposes, and information they depict. The student will be able to:

- 03.01 Compare and contrast various forms of maps in terms of purpose, information, and application.
- 03.02 Convert latitude and longitude information between DMS and DD forms.
- 03.03 Identify sources of GIS information and their applicability to GIS projects.
- 03.04 Demonstrate how to read a topographical map

04.0 Demonstrate an understanding of coordinate systems, projections, scale, multi-spectral imagery, and other concepts integral to geographic information systems. The student will be able to:

- 04.01 Identify terminology associated with map coordinate systems and location
- 04.02 Interpret location using the Geographic Coordinate System to identify absolute location
- 04.03 Identify terminology associated with maps, map scale, map projections, and orienteering

04.04 Explain the Universe Transverse Mercator (UTM) coordinate system
04.05 Interpret locations using the UTM coordinate system
04.06 Demonstrate an understanding of how maps are created using aerial photography.

05.0 Create, change, and manipulate data used to create a map. The student will be able to:

05.01 Identify the primary components of the GIS Project Management Model
05.02 Utilize a GPS unit to collect waypoints, measure distance, and calculate area.
05.03 Create and customize a localized satellite map scenario using an appropriate GIS software application.
05.04 Demonstrate the use of zooming, identifying, bookmarks, selecting, and panning tools.
05.05 Explain the components of the map display and the tools in the tool bars of common mapping software.
05.06 Explain the need for and uses of metadata.
05.07 Demonstrate geocoding addresses, heads-up digitizing, editing symbols, clipping data layers, and creating buffers.
05.08 Demonstrate various styles of displaying symbols of data, sorting querying, and selection techniques
05.09 Demonstrate editing feature data
05.10 Explain spatial reference
05.11 Demonstrate how to georeference an Image Data Layer and add Control Points

06.0 Layout and print maps. The student will be able to:

06.01 Demonstrate the ability to define page margins and parameters for printing a specific size
06.02 Demonstrate effective use of map elements that must be included in a map including title, author, data, legend, scale bar, north arrow
06.03 Demonstrate effective use of page space through map scale and frame size
06.04 Demonstrate process of creating digital archives of maps utilizing the export command

07.0 Design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. The student will be able to:

07.01 Research, compare, and contrast GIS technology careers (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of GIS technology careers, the need for GIS technology workers, etc.).
07.02 Describe the variety of occupations and professions within the world of GIS technology including those where information technology is either in a primary focus or in a supportive role.
07.03 Describe job requirements for the variety of occupations and professions within the global world of GIS technology.
07.04 Analyze personal skills and aptitudes in comparison with GIS technology career opportunities.
07.05 Refine and implement a plan to facilitate personal growth and skill development related to GIS technology career opportunities.

07.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

08.0 Customize the display of geospatial data. The student will be able to:

08.01 Edit Layer Properties.
08.02 Create Layer Files.
08.03 Edit an attribute table by adding a new field with calculating values.
08.04 Perform relates and joins with data tables.

09.0 Manage, query, and symbolize geospatial data. The student will be able to:

09.01 Label features.
09.02 Insert, copy, and paste data into new data frames.
09.03 Create graphs and reports from data.
09.04 Demonstrate how to analyze land use, population, and flood zone data.
09.05 Create geospatial data.
09.06 Symbolize a raster layer.
09.07 Resolve unmatched addresses while geocoding addresses.
09.08 Use dissolve features, hyperlink, spatially join data, and create buffer functions.

10.0 Create a geospatial model. The student will be able to:

10.01 Create a geodatabase, import existing feature classes into a geodatabase, and import multiple feature classes to a geodatabase.
10.02 Plan and build a local data inventory.

11.0 Create, change, and manipulate remotely sensed image data. The student will be able to:

11.01 View single band and multispectral images.
11.02 Perform various manipulations to an image including creating a subset of an image, mosaic two georeferenced images, and orthorectification.
11.03 Perform image analysis by orthorectifying non-georeferenced digital images to existing map features.
11.04 Use various tools in image analysis to extract land features from imagery data.
11.05 Categorize land cover types using image analysis tools.
11.06 Conduct vegetation analysis on imagery using image analysis tools
11.07 Evaluate areas of change in images.
11.08 Enhance an image by adjusting the brightness and contrast, adjusting the histogram, applying custom histogram stretches, sharpening and smoothing its appearance.
11.09 Convert an image from color IR to natural color by performing a resolution merge.

21.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

21.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
21.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
21.03 Present information formally and informally for specific purposes and audiences. AF2.9

22.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

- 22.01 Demonstrate knowledge of arithmetic operations. AF3.2
- 22.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
- 22.03 Construct charts/tables/graphs using functions and data. AF3.5

23.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

- 23.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
- 23.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

24.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

- 24.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
- 24.02 Locate, organize and reference written information from various sources. CM 3.0
- 24.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
- 24.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
- 24.05 Apply active listening skills to obtain and clarify information. CM 7.0
- 24.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
- 24.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

25.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

- 25.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
- 25.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
- 25.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
- 25.04 Conduct technical research to gather information necessary for decision-making. PS 4.0

26.0 Use information technology tools. – The student will be able to:

- 26.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
- 26.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
- 26.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
- 26.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

27.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

27.01 Describe the nature and types of business organizations. SY 1.0
27.02 Explain the effect of key organizational systems on performance and quality.
27.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
27.04 Explain the impact of the global economy on business organizations.

30.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

30.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
30.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
30.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
30.04 Interpret and explain written organizational policies and procedures. ELR 2.0

Course Number: GIS0091
Occupational Completion Point: B
GIS Technician – 300 Hours – SOC Code 15-1099.07

12.0 Create surface models of spatial data to map distance. The student will be able to:

12.01 Create a straight line distance calculation.
12.02 Create a cost weighted distance calculation based on multiple inputs (costs).
12.03 Analyze an allocation grid created from a distance analysis calculation.

13.0 Demonstrate density models of spatial data. The student will be able to:

13.01 Identify different distance density calculation techniques.
13.02 Calculate density using both the kernel and simple calculation methods.

14.0 Demonstrate different surface interpolation methods. The student will be able to:

14.01 Create a surface from a set of features using the Inverse Distance Weighted interpolation method.
14.02 Create a surface from a set of features using the Spline interpolation method.
14.03 Create a surface from a set of features using the Kriging interpolation method.

15.0 Demonstrate different surface analysis methods. The student will be able to:

15.01 Create elevation contour data from an elevation raster.
15.02 Calculate and display slope derived from an elevation raster.
15.03 Determine and display aspect from an elevation raster.
15.04 Create a hillshade surface from an elevation raster.
15.05 Calculate the viewshed of a surface to determine visible objects.
15.06 Calculate the cut/fill of a surface to estimate volume changes.

16.0 Use different statistical methods in raster analysis. The student will be able to:

16.01 Calculate cell statistics using temporal raster grid data.
16.02 Calculate neighborhood statistics and zonal statistics using raster grid data

17.0 Interpret different types of spatial data used in 3D visualization and analysis. The student will be able to:

17.01 Navigate various types of surfaces.
17.02 Explore methods of obtaining, downloading, and extracting free data using the Internet.
17.03 Build 3D datasets.
17.04 Display 2D features onto a 3D surface.
17.05 Create shapefiles to view in a 3D environment.
17.06 Construct a 3D model of an urban environment.
17.07 Display georeferenced data measurements in 3D.
17.08 Apply Interpolation methods.
17.09 Utilize georeferenced 2D data in a 3D environment to provide valuable information.
17.10 Create contour lines in a 3D environment

18.0 Create network datasets using existing shapefiles and geodatabases. The student will be able to:

18.01 Find the most efficient routes for multiple stops on a complex street network.
18.02 Generate directions from one location to another using a street network.
18.03 Find the closest facility from a location on a complex street network.
18.04 Define service areas using a street network based on travel time.
18.05 Create an Origin-Destination Cost Matrix to communicate costs associated with travel from facilities to destinations in a geospatial network.
18.06 Demonstrate modeling of real world traffic flow.
18.07 Create a 3D map using a GPS unit for use in a class wide project.

19.0 Create a 3D map using a GPS unit for use in a class wide project.

20.0 Create an extensive campus-based geospatial project. The student will be able to:

20.01 Create a campus inventory.
20.02 Plan a complete geospatial project.
20.03 Implement a campus-based geospatial project.
20.04 Organize project into an effective report including map layouts.
20.05 Present project using a written and/or oral report.

28.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

28.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
28.02 Explain emergency procedures to follow in response to workplace accidents.
28.03 Create a disaster and/or emergency response plan. SHE 2.0

29.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

29.01	Employ leadership skills to accomplish organizational goals and objectives.	LT1.0
29.02	Establish and maintain effective working relationships with others in order to accomplish objectives and tasks.	LT3.0
29.03	Conduct and participate in meetings to accomplish work tasks.	LT 4.0
29.04	Employ mentoring skills to inspire and teach others.	LT 5.0

31.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

31.01	Identify and demonstrate positive work behaviors needed to be employable.	ECD 1.0
31.02	Develop personal career plan that includes goals, objectives, and strategies.	ECD 2.0
31.03	Examine licensing, certification, and industry credentialing requirements.	ECD 3.0
31.04	Maintain a career portfolio to document knowledge, skills, and experience.	ECD 5.0
31.05	Evaluate and compare employment opportunities that match career goals.	ECD 6.0
31.06	Identify and exhibit traits for retaining employment.	ECD 7.0
31.07	Identify opportunities and research requirements for career advancement.	ECD 8.0
31.08	Research the benefits of ongoing professional development.	ECD 9.0
31.09	Examine and describe entrepreneurship opportunities as a career planning option.	ECD 10.0

32.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

32.01	Identify and describe the services and legal responsibilities of financial institutions.	FL 2.0
32.02	Describe the effect of money management on personal and career goals.	FL 3.0
32.03	Develop a personal budget and financial goals.	FL3.1
32.04	Complete financial instruments for making deposits and withdrawals.	FL3.2
32.05	Maintain financial records.	FL3.3
32.06	Read and reconcile financial statements.	FL3.4
32.07	Research, compare and contrast investment opportunities.	

2011 – 2012

Florida Department of Education
Student Performance Benchmarks

Course Title: **Introduction to GIS/RS Technology**
Course Number: **8600260**
Course Credit: **1**

Course Description:

While learning about the basics from the evolution of maps and projections, to learning about the modern uses of a geographic information system, students will complete many "hands-on" activities such as creating their own maps using compasses, rulers and tape measures. Specific areas of focus for this course include fundamental GIS and remote sensing concepts, project management strategies, and essential basic computer skills. Students will acquire a basic understanding of geographic terms and concepts necessary for the appropriate use of GIS, including concepts of spatial variables, scale, map projection, and map coordinate systems. Students will also be exposed to the history of GIS, how GIS fits into overall information management systems, and a variety of applications in which GIS can contribute to analysis and decision-making. They will also use a software application used to simulate satellite movements and utilize data, imagery, and GIS software to study their state, county, and school campus.

This hands-on course provides step by step instructions that will take you from learning the basics of these programs; like launching a map, viewing and editing metadata, to creating new shapefiles, and eventually to building a local map with data that you download from the Internet. While learning these valuable skills, students will be using the same geospatial tools that GIS Technicians in the industry are using.

01.0 Perform general computer application activities. The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.S.1.2; MA.912.S.3.2; SC.912.N.1.1.

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Demonstrate basic computer file management skills.
- 01.03 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.04 Use spreadsheet, presentation software, and integrated software packages to enhance communication.
- 01.05 Use computer networks (e.g., Internet, on-line databases) to facilitate collaborative or individual learning and communication.
- 01.06 Use computers to access, retrieve, organize, process, maintain, interpret, and evaluate data and information.

02.0 Understand the history, societal implications, underlying theories, and industry applications of GIS technology. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N2.2; SC.912.N3.2; SC.912.E.5.7; SC.912.N.5.8; SC.912.N.5.9; SC.912.P.10.16;

SC.912.P.10.17; SC.912.P.10.18; SC.912.P.10.19; SC.912.N.12.17; SC.912.P.10.20; SC.912.P.10.21; SC.912.E.5.10; SC.912.E.5.8; SC.912.E.5.9.

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02.01 Discuss the history and societal implications of mapping, GIS, and remote sensing.
02.02 Describe the underlying theories of GIS and remote sensing technologies.
02.03 Identify industry applications for GIS technology.

03.0 Understand map types, purposes, and information they depict. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1; SC.912.E.5.10; SC.912.E.6.2; SC.912.L.14.53; MA.912.D.7.1; MA.912.D.7.2; MA.912.A.1.5; MA.912.A.5.1; MA.912.A.5.4; MA.912.G.8.3; MA.912.D.8.6.

03.01 Compare and contrast various forms of maps in terms of purpose, information, and application.
03.02 Convert latitude and longitude information between DMS and DD forms.
03.03 Identify sources of GIS information and their applicability to GIS projects.
03.04 Demonstrate how to read a topographical map

04.0 Demonstrate an understanding of coordinate systems, projections, scale, multi-spectral imagery, and other concepts integral to geographic information systems. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1; SC.912.E.5.10; MA.912.G.1.1, MA.912.G.1.4; MA.912.A.1.5; MA.912.A.5.1; MA.912.A.5.4.

04.01 Identify terminology associated with map coordinate systems and location
04.02 Interpret location using the Geographic Coordinate System to identify absolute location
04.03 Identify terminology associated with maps, map scale, map projections, and orienteering
04.04 Explain the Universe Transverse Mercator (UTM) coordinate system
04.05 Interpret locations using the UTM coordinate system
04.06 Demonstrate an understanding of how maps are created using aerial photography.

05.0 Create, change, and manipulate data used to create a map. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1; SC.912.N.1.2; MA.912.S.1.2; MA.912.G.4.2; MA.912.S.3.2; MA.912.G.7.5; MA.912.D.7.1; MA.912.D.7.2; SC.912.P.12.9.

05.01 Identify the primary components of the GIS Project Management Model
05.02 Utilize a GPS unit to collect waypoints, measure distance, and calculate area.
05.03 Create and customize a localized satellite map scenario using an appropriate GIS software application.
05.04 Demonstrate the use of zooming, identifying, bookmarks, selecting, and panning tools.

05.05 Explain the components of the map display and the tools in the tool bars of common mapping software.
05.06 Explain the need for and uses of metadata.
05.07 Demonstrate geocoding addresses, heads-up digitizing, editing symbols, clipping data layers, and creating buffers.
05.08 Demonstrate various styles of displaying symbols of data, sorting querying, and selection techniques
05.09 Demonstrate editing feature data
05.10 Explain spatial reference
05.11 Demonstrate how to georeference an Image Data Layer and add Control Points

06.0 Layout and print maps. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1.

06.01 Demonstrate the ability to define page margins and parameters for printing a specific size
06.02 Demonstrate effective use of map elements that must be included in a map including title, author, data, legend, scale bar, north arrow
06.03 Demonstrate effective use of page space through map scale and frame size
06.04 Demonstrate process of creating digital archives of maps utilizing the export command

07.0 Design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1; MA.912.D.7.1; MA.912.D.7.2; SC.912.L.17.13; SC.912.L.17.20.

07.01 Research, compare, and contrast GIS technology careers (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of GIS technology careers, the need for GIS technology workers, etc.).
07.02 Describe the variety of occupations and professions within the world of GIS technology including those where information technology is either in a primary focus or in a supportive role.
07.03 Describe job requirements for the variety of occupations and professions within the global world of GIS technology.
07.04 Analyze personal skills and aptitudes in comparison with GIS technology career opportunities.
07.05 Refine and implement a plan to facilitate personal growth and skill development related to GIS technology career opportunities.
07.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

21.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

21.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
21.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
21.03 Present information formally and informally for specific purposes and audiences. AF2.9

22.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

- 22.01 Demonstrate knowledge of arithmetic operations. AF3.2
- 22.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
- 22.03 Construct charts/tables/graphs using functions and data. AF3.5

23.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

- 23.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
- 23.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Essential GIS/RS Tools & Processes**
Course Number: **8600270**
Course Credit: **1**

Course Description:

Students in this course will use their knowledge of mapping and cataloging to complete numerous geospatial applications. They will learn techniques in displaying, managing, querying, symbolizing, and Create geospatial data. Students will learn the skills required to work on and/or build advanced GIS/RS projects.

Students will follow a course of hands-on instruction to learn advanced skills ranging from introductory spatial analysis to examining spatial relationships within a specified area. Additionally, they will study site suitability to using three-dimensional generating software to gain a different perspective of their environment by modeling surfaces. Students will use scenarios to map features and study relationships that exist in their local community.

Students will use remote sensing applications and data to develop skills that will allow them to take images and convert them to data that they will use for different types of analyses. The types of analyses will include using data in image analysis, feature extraction, vegetation mapping and change detection, and image enhancement.

08.0 Customize the display of geospatial data. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1; MA.912.D.7.1; MA.912.D.7.2; SC.912.E.6.6; SC.912.E.5.10.

08.01 Edit Layer Properties.
08.02 Create Layer Files.
08.03 Edit an attribute table by adding a new field with calculating values.
08.04 Perform relates and joins with data tables.

09.0 Manage, query, and symbolize geospatial data. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.E.6.2; SC.912.E.6.3; SC.912.E.6.4; SC.912.E.6.5; SC.912.L.17.12; MA.912.S.1.2; SC.912.E.6.6; SC.912.E.7.1; SC.912.E.7.2; SC.912.E.7.8; MA.912.S.4.4; MA.912.A.2.13; MA.912.D.7.1; MA.912.D.7.2.

09.01 Label features.
09.02 Insert, copy, and paste data into new data frames.
09.03 Create graphs and reports from data.
09.04 Demonstrate how to analyze land use, population, and flood zone data.
09.05 Create geospatial data.
09.06 Symbolize a raster layer.

09.07 Resolve unmatched addresses while geocoding addresses.
09.08 Use dissolve features, hyperlink, spatially join data, and create buffer functions.

10.0 Create a geospatial model. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1; MA.912.D.7.1; MA.912.D.7.2; SC.912.L.17.13; SC.912.L.17.20.

10.01 Create a geodatabase, import existing feature classes into a geodatabase, and import multiple feature classes to a geodatabase.
10.02 Plan and build a local data inventory.

11.0 Create, change, and manipulate remotely sensed image data. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1; MA.912.G.2.4; MA.912.G.2.7; MA.912.G.7.5; MA.912.G.7.6; MA.912.G.7.7; SC.912.P.10.18; SC.912.E.6.4; SC.912.L.17.1; SC.912.L.17.3; SC.912.L.17.7; SC.912.L.14.53; SC.912.E.7.4; SC.912.E.6.2; SC.912.E.6.3; SC.912.L.17.4; SC.912.E.6.6; SC.912.L.16.10; SC.912.P.10.17; SC.912.P.10.18.

11.01 View single band and multispectral images.
11.02 Perform various manipulations to an image including creating a subset of an image, mosaic two georeferenced images, and orthorectification.
11.03 Perform image analysis by orthorectifying non-georeferenced digital images to existing map features.
11.04 Use various tools in image analysis to extract land features from imagery data.
11.05 Categorize land cover types using image analysis tools.
11.06 Conduct vegetation analysis on imagery using image analysis tools
11.07 Evaluate areas of change in images.
11.08 Enhance an image by adjusting the brightness and contrast, adjusting the histogram, applying custom histogram stretches, sharpening and smoothing its appearance.
11.09 Convert an image from color IR to natural color by performing a resolution merge.

24.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

24.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
24.02 Locate, organize and reference written information from various sources. CM 3.0
24.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
24.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
24.05 Apply active listening skills to obtain and clarify information. CM 7.0
24.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
24.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

25.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

25.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
25.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
25.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
25.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

26.0 Use information technology tools. – The student will be able to:

26.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
26.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
26.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
26.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

27.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

27.01 Describe the nature and types of business organizations. SY 1.0
27.02 Explain the effect of key organizational systems on performance and quality.
27.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
27.04 Explain the impact of the global economy on business organizations.

30.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

30.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
30.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
30.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
30.04 Interpret and explain written organizational policies and procedures. ELR 2.0

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **GIS/RS Analysis & Modeling**
Course Number: **8600280**
Course Credit: **1**

Course Description:

This course covers Surface Analysis, 3D modeling, and working with street networks.

This course directs students through five types of applications in Surface Analysis. It focuses on the various methods and uses of displaying continuous, or grid, data over a surface. Students will be expected to map data such as elevation, rainfall and temperature – data that differs from one location to the next on the surface of the earth. The five types of analyses used in this course are: mapping distance, density, interpolation, surface analysis, and statistics. This course will conclude with a short project where student will use their newly acquired skills to perform surface analysis tasks to their local area.

There is a strong emphasis on students viewing their local area and the world in three dimensions. Students will learn skills such as viewing and displaying data, acquiring and processing data from online resources, displaying non-elevation data in 3D, applying surface analysis to 3D, adding raster and vector data, animating data, and exporting projects.

Students will also explore in greater depth data layers previously studied in order to analyze the flow or navigation of networked data. They will also delve into the specifics of network analysis and examine how problems dealing with geospatial networks and routing may be found in the business world and in communities. The five types of network analyses covered in this course include Exploring Geospatial Networks, Finding the Best Route, Finding the Closest Facility, Determining Service Areas, and Modeling Real World Traffic Flow.

12.0 Create surface models of spatial data to map distance. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.E.5.11; SC.912.N.3.5; SC.912.P.12.1; SC.912.P.12.9; MA.912.A.10.1; MA.912.A.10.2; MA.912.A.10.3; MA.912.G.1.1; MA.912.G.2.4; MA.912.A.3.14; MA.912.A.3.15.

12.01 Create a straight line distance calculation.
12.02 Create a cost weighted distance calculation based on multiple inputs (costs).
12.03 Analyze an allocation grid created from a distance analysis calculation.

13.0 Demonstrate density models of spatial data. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.3.5; SC.912.P.12.9; MA.912.D.9.1; MA.912.S.1.2; MA.912.S.3.2.

13.01 Identify different distance density calculation techniques.
13.02 Calculate density using both the kernel and simple calculation methods.

14.0 Demonstrate different surface interpolation methods. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.N.1.1; MA.912.S.1.2; MA.912.G.8.6; MA.912.S.3.2; MA.912.S.4.5; SC.912.E.7.3; SC.912.E.7.4; SC.912.E.6.2.

14.01 Create a surface from a set of features using the Inverse Distance Weighted interpolation method.
14.02 Create a surface from a set of features using the Spline interpolation method.
14.03 Create a surface from a set of features using the Kriging interpolation method.

15.0 Demonstrate different surface analysis methods. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.E.6.3; SC.912.P.12.1; SC.912.E.12.9; MA.912.C.5.7; MA.912.C.5.8; MA.912.A.3.9; MA.912.A.3.11; MA.912.G.7.5; MA.912.G.7.7.

15.01 Create elevation contour data from an elevation raster.
15.02 Calculate and display slope derived from an elevation raster.
15.03 Determine and display aspect from an elevation raster.
15.04 Create a hillshade surface from an elevation raster.
15.05 Calculate the viewshed of a surface to determine visible objects.
15.06 Calculate the cut/fill of a surface to estimate volume changes.

16.0 Use different statistical methods in raster analysis. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.P.12.9; SC.912.N.4.2; MA.912.S.1.2; MA.912.S.3.2; SC.912.L.17.1.

16.01 Calculate cell statistics using temporal raster grid data.
16.02 Calculate neighborhood statistics and zonal statistics using raster grid data

17.0 Interpret different types of spatial data used in 3d visualization and analysis. The student will be able to:

This standard supports the following Sunshine State Standards: SC.912.P.12.9; MA.912.A.4.5; MA.912.A.4.9; MA.912.A.4.10; MA.912.C.5.5; MA.912.C.5.7; MA.912.C.3.2.

17.01 Navigate various types of surfaces.
17.02 Explore methods of obtaining, downloading, and extracting free data using the Internet.
17.03 Build 3D datasets.
17.04 Display 2D features onto a 3D surface.
17.05 Create shapefiles to view in a 3D environment.
17.06 Construct a 3D model of an urban environment.
17.07 Display georeferenced data measurements in 3D.
17.08 Apply Interpolation methods.
17.09 Utilize georeferenced 2D data in a 3D environment to provide valuable information.
17.10 Create contour lines in a 3D environment

18.0 Create network datasets using existing shapefiles and geodatabases. The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.D.2.2; MA.912.D.7.1; MA.912.D.7.2; MA.912.D.4.1; MA.912.A.7.9; MA.912.C.3.8; MA.912.D.8.1; MA.912.D.8.2; MA.912.F.5.1; MA.912.F.5.2; MA.912.S.5.1.

18.01 Find the most efficient routes for multiple stops on a complex street network.
18.02 Generate directions from one location to another using a street network.
18.03 Find the closest facility from a location on a complex street network.
18.04 Define service areas using a street network based on travel time.
18.05 Create an Origin-Destination Cost Matrix to communicate costs associated with travel from facilities to destinations in a geospatial network.
18.06 Demonstrate modeling of real world traffic flow.
18.07 Create a 3D map using a GPS unit for use in a class wide project.

28.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

28.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
28.02 Explain emergency procedures to follow in response to workplace accidents.
28.03 Create a disaster and/or emergency response plan. SHE 2.0

29.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

29.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
29.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
29.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
29.04 Employ mentoring skills to inspire and teach others. LT 5.0

31.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

31.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
31.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
31.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
31.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
31.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
31.06 Identify and exhibit traits for retaining employment. ECD 7.0
31.07 Identify opportunities and research requirements for career advancement. ECD 8.0
31.08 Research the benefits of ongoing professional development. ECD 9.0
31.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

32.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

32.01	Identify and describe the services and legal responsibilities of financial institutions.	FL 2.0
32.02	Describe the effect of money management on personal and career goals.	FL 3.0
32.03	Develop a personal budget and financial goals.	FL3.1
32.04	Complete financial instruments for making deposits and withdrawals.	FL3.2
32.05	Maintain financial records.	FL3.3
32.06	Read and reconcile financial statements.	FL3.4
32.07	Research, compare and contrast investment opportunities.	

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Advanced GIS/RS Applications**
Course Number: **8600290**
Course Credit: **1**

Course Description:

This project-based, capstone course challenges students to apply all skills and techniques learned in the previous three courses to create their first extensive GIS and Remote Sensing project. In this project, students will work in teams to create a three-dimensional map of their campus using GIS and RS tools. Once the base map is completed, each student selects one of the designated campus-based projects to complete. Students will be involved with all parts of the process including problem identification, data collection using GPS units, determining the appropriate type of analysis to be conducted or type of product to address the problem statement, performing the analysis, Create their solution, and formally presenting the project to interested stakeholders. Each project integrates project planning, geographic problem solving, GIS/RS tools and software applications, project management, data creation, data manipulation, data analysis, report, and presentations.

19.0 Create a 3D map using a GPS unit for use in a class wide project.

This standard supports the following Sunshine State Standards: MA.912.D.7.1; MA.912.D.7.2; MA.912.A.10.1; MA.912.C.5.8.

20.0 Create an extensive campus-based geospatial project. The student will be able to:

This standard supports the following Sunshine State Standards: MA.912.S.2.1; SC.912.N.1.1, SC.912.N.1.2; SC.912.L.17.1; SC.912.L.17.18.

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20.01 Create a campus inventory.
20.02 Plan a complete geospatial project.
20.03 Implement a campus-based geospatial project.
20.04 Organize project into an effective report including map layouts.
20.05 Present project using a written and/or oral report.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Computer Systems Technology**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	8732100	I470104
CIP Number	0647.010400	0647.010400
Grade Level	9-12, 30, 31	30, 31
Standard Length	11 credit hours	1650 hours
Teacher Certification	COMP SVC @7 G ELECTRONIC @7 G BUS MACH @7 G	COMP SVC @7 G ELECTRONIC @7 G BUS MACH @7 G
CTSO	FBLA BPA SkillsUSA	Phi Beta Lambda BPA SkillsUSA
SOC Codes (all applicable)	15-1041, 49-2011, 15-1071	15-1041, 49-2011, 15-1071
Facility Code	212 http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	Mathematics: 10.0 Language: 9.0 Reading: 9.0

Purpose

The purpose of this program is to prepare students for employment or advanced training in a variety of occupations in the information technology industry.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the information technology industry; technical and product skills, underlying principles of technology , planning, management, finance, labor issues, community issues and health, safety, and environmental issues.

The course content includes, but is not limited to, communication, leadership skills, human relations and employability skills; and safe, efficient work practices.

Program Structure

This program is a planned sequence of instruction consisting of five occupational completion points. When the recommended sequence is followed, the structure will allow students to complete specified portions of the program for employment or to remain for advanced training certifications. A student who completes the applicable competencies at any occupational completion point may either continue with the training or become an occupational completer.

When offered at the post secondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	EEV0501	End User Support Technician	450	15-1041
B	EEV0502	PC Electronics Installer	150	49-2011
C	EEV0503	Computer Support Specialist – LAN Technician	300	15-1041
D	EEV0506	Field Service Technician	300	15-1071
E	EEV0508	Digital Electronics Technician	450	15-1071

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8732110	Computer Systems Technology 1	1 credit	15-1041	3
	8732120	Computer Systems Technology 2	1 credit	15-1041	3
	8732130	Computer Systems Technology 3	1 credit	15-1041	3
B	8732140	Computer Systems Technology 4	1 credit	49-2011	3
C	8732150	Computer Systems Technology 5	1 credit	15-1041	3
	8732160	Computer Systems Technology 6	1 credit	15-1041	3
D	8732170	Computer Systems Technology 7	1 credit	15-1071	3
	8732180	Computer Systems Technology 8	1 credit	15-1071	3
E	8732190	Computer Systems Technology 9	1 credit	15-1071	3
	8732191	Computer Systems Technology 10	1 credit	15-1071	3
	8732192	Computer Systems Technology 11	1 credit	15-1071	3

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills for secondary students. For postsecondary students, Phi Beta Lambda and BPA are the appropriate student organizations. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 10.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

The PSAV component of this program (I470104) has a statewide articulation agreement approved by the Articulation Coordinating Committee:

1. Computer Engineering Technology AS/AAS (1615040200/0615040200) – 9 credits (For PSAV programs including the 4-course Cisco Networking Academy, this program articulates an additional 12 credits.)

For details on articulation agreements which correlate to programs and industry certifications refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Demonstrate proficiency in software/hardware fundamentals.
02.0 Demonstrate proficiency in customer relations.
03.0 Demonstrate appropriate communication skills.
04.0 Demonstrate employability skills.
05.0 Demonstrate proficiency in basic laboratory practices.
06.0 Demonstrate proficiency in electronic fundamentals.
07.0 Demonstrate appropriate understanding of basic math.
08.0 Demonstrate appropriate understanding of basic science.
09.0 Demonstrate proficiency in computer systems.
10.0 Demonstrate proficiency in peripheral equipment.
11.0 Demonstrate proficiency in network fundamentals
12.0 Demonstrate proficiency in network equipment and physical site requirements and considerations.
13.0 Demonstrate proficiency in advanced computer concepts
14.0 Demonstrate proficiency in advanced operating systems
15.0 Demonstrate an understanding of entrepreneurship.
16.0 Demonstrate language arts knowledge and skills.
17.0 Demonstrate mathematics knowledge and skills.
18.0 Demonstrate science knowledge and skills.
19.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
20.0 Solve problems using critical thinking skills, creativity and innovation.
21.0 Use information technology tools.
22.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
23.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
24.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
25.0 Describe the importance of professional ethics and legal responsibilities.
26.0 Explain the importance of employability skill and entrepreneurship skills.
27.0 Demonstrate personal money-management concepts, procedures, and strategies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Computer Systems Technology**
PSAV Number: **I470104**

Course: EEV0501
Occupational Completion Point - A (450 Hours)
End User Support Technician - Level I Support Technician
Help Desk Specialist - (SOC 15-1041)

01.0 Demonstrate proficiency in software/hardware fundamentals. – The student will be able to:

- 01.01 Apply OS commands, syntax usage and parameters.
- 01.02 Demonstrate knowledge of OS file systems.
- 01.03 Demonstrate basic command-line/GUI OS navigation
- 01.04 Demonstrate basic operation and usage of common applications.
- 01.05 Demonstrate operation and usage of fundamental OS utilities
- 01.06 Demonstrate operation and usage of virus protection software.
- 01.07 Demonstrate operation and usage of browser software and the internet.
- 01.08 Locate and install device drivers.
- 01.09 Understand compression technologies.
- 01.10 Identify PC/server front panel controls, indicators, rear case connectors and indicators.
- 01.11 Demonstrate an understanding of the boot process.

02.0 Demonstrate proficiency in customer relations. – The student will be able to:

- 02.01 Describe and demonstrate appropriate personal hygiene and professional attire.
- 02.02 Describe and demonstrate effective listening techniques.
- 02.03 Describe and apply techniques for instilling customer confidence and satisfaction.
- 02.04 Describe and apply techniques for keeping the customer informed.
- 02.05 Describe and apply effective follow-up techniques.
- 02.06 Demonstrate discretion in interacting with customers in field and business environments.
- 02.07 Demonstrate an understanding of basic conflict resolution.

03.0 Demonstrate appropriate communication skills. – The student will be able to:

- 03.01 Write logical and understandable statements, or phrases, to accurately fill out forms and invoices commonly used in business and industry.
- 03.02 Read and use graphs, charts, diagrams, tables, parts manuals, and information sources commonly used in this industry/occupational area.
- 03.03 Read and follow written and oral instructions.
- 03.04 Answer and ask questions coherently and concisely.
- 03.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
- 03.06 Demonstrate appropriate telephone/communication skills.

04.0 Demonstrate employability skills. – The student will be able to:

- 04.01 Prepare a resume.
- 04.02 Conduct a job search.
- 04.03 Secure information about a job.
- 04.04 Identify and provide documents, which may be required when interviewing for a job.
- 04.05 Complete a job application form correctly and completely.
- 04.06 Demonstrate competence in job interview techniques.
- 04.07 Identify and demonstrate appropriate responses to criticism from employer, supervisor or other employees.
- 04.08 Identify and demonstrate acceptable work habits.
- 04.09 Demonstrate knowledge of how to make job changes appropriately.
- 04.10 Demonstrate knowledge of employee health issues.
- 04.11 Demonstrate efficient organizational skills.
- 04.12 Demonstrate knowledge of the "Right-To-Know Law" as recorded in (29 CFR-1910.1200).

16.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

- 16.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
- 16.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
- 16.03 Present information formally and informally for specific purposes and audiences. AF2.9

17.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

- 17.01 Demonstrate knowledge of arithmetic operations. AF3.2
- 17.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
- 17.03 Construct charts/tables/graphs using functions and data. AF3.5

18.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

- 18.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
- 18.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

19.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

- 19.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
- 19.02 Locate, organize and reference written information from various sources. CM 3.0
- 19.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
- 19.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
- 19.05 Apply active listening skills to obtain and clarify information. CM 7.0
- 19.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0

19.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

20.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

20.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
20.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
20.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
20.04 Conduct technical research to gather information necessary for decision-making. PS 4.0

21.0 Use information technology tools. – The student will be able to:

21.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
21.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
21.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
21.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

22.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

22.01 Describe the nature and types of business organizations. SY 1.0
22.02 Explain the effect of key organizational systems on performance and quality.
22.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
22.04 Explain the impact of the global economy on business organizations.

23.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

23.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
23.02 Explain emergency procedures to follow in response to workplace accidents.
23.03 Create a disaster and/or emergency response plan. SHE 2.0

24.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

24.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
24.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
24.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
24.04 Employ mentoring skills to inspire and teach others. LT 5.0

25.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

25.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
25.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
25.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
25.04 Interpret and explain written organizational policies and procedures. ELR 2.0

26.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

26.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
26.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
26.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
26.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
26.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
26.06 Identify and exhibit traits for retaining employment. ECD 7.0
26.07 Identify opportunities and research requirements for career advancement. ECD 8.0
26.08 Research the benefits of ongoing professional development. ECD 9.0
26.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

27.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

27.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
27.02 Describe the effect of money management on personal and career goals. FL 3.0
27.03 Develop a personal budget and financial goals. FL3.1
27.04 Complete financial instruments for making deposits and withdrawals. FL3.2
27.05 Maintain financial records. FL3.3
27.06 Read and reconcile financial statements. FL3.4
27.07 Research, compare and contrast investment opportunities.

Course: EEV0502
Occupational Completion Point - Data Code - B (150 Hours)
PC Electronics Installer - Level II (SOC 49-2011)

05.0 Demonstrate proficiency in basic laboratory practices. – The student will be able to:

05.01 Apply proper Occupational Safety Health Administration (OSHA) safety standards.
05.02 Make electrical/voice/data connections.
05.03 Identify and use hand tools properly.
05.04 Identify and use power tools properly.
05.05 Demonstrate acceptable soldering and desoldering and rework and repair techniques.
05.06 Demonstrate electrostatic discharge (ESD) safety procedures.

06.0 Demonstrate proficiency in electronic fundamentals. – The student will be able to:

- 06.01 06.01 Solve problems utilizing metric prefixes.
- 06.02 06.02 Identify sources of electricity.
- 06.03 06.03 Define voltage, current, resistance, power and energy.
- 06.04 06.04 Apply Ohm's law and power formulas.
- 06.05 06.05 Read and interpret color codes and symbols to identify electrical/electronic components and values.
- 06.06 06.06 Measure properties of a circuit using appropriate test equipment.
- 06.07 06.07 Identify properties of an AC signal.
- 06.08 06.08 Identify AC sources.
- 06.09 06.09 Analyze and measure AC voltages using appropriate test equipment.

07.0 Demonstrate appropriate understanding of basic math. – The student will be able to:

- 07.01 Solve problems for volume, weight, area and circumference and perimeter measurements for rectangles, square and cylinders.
- 07.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, and feet and inches.
- 07.03 Add, subtract, multiply and divide using fractions, decimals and whole numbers.
- 07.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
- 07.05 Demonstrate an understanding of federal, state and local taxes and their computation.

08.0 Demonstrate appropriate understanding of basic science. – The student will be able to:

- 08.01 Demonstrate an understanding of the effects of temperature extremes and moisture content in regards to computer/network equipment.
- 08.02 Demonstrate an understanding of the impact and effects of electrostatic discharge (ESD), power surges, grounding, and lighting strikes.
- 08.03 Apply the scientific method to draw conclusions or make interferences from data.
- 08.04 Demonstrate deductive reasoning techniques when troubleshooting.
- 08.05 Demonstrate an understanding of the effects of heat load and ventilation in regards to computer/network equipment.
- 08.06 Identify safety and health related issues, including exposure to work related chemicals and hazardous materials, and demonstrate the appropriate precautionary measures.
- 08.07 Demonstrate an understanding of environmental impact and regulations in regards to the appropriate disposal of computer/network equipment.

Course: EEV0503
Occupational Completion Point - C (300 Hours)
Computer Support Specialist - LAN Technician (SOC 15-1041)

09.0 Demonstrate proficiency in computer systems. – The student will be able to:

- 09.01 Interpret and understand computer system diagrams and technical literature.
- 09.02 Perform personal computer system tear-down, cleaning and inspection.
- 09.03 Upgrade and troubleshoot a variety of motherboards.
- 09.04 Demonstrate knowledge of bus systems and processor architecture.

09.05 Understand and troubleshoot memory systems.
09.06 Understand, troubleshoot and replace power supply systems.
09.07 Troubleshoot a microcomputer system.
09.08 Demonstrate system upgrading techniques.
09.09 Identify form factors: power supplies, motherboards, cases
09.10 Demonstrate proficiency in setup, configuring, upgrade and troubleshooting of laptop and mobile data devices.
09.11 Apply troubleshooting techniques using operating systems utilities.
09.12 Demonstrate the use of diagnostic software.
09.13 Install configure and troubleshooting operating systems.
09.14 Install configure and troubleshooting commonly used business applications.

10.0 Demonstrate proficiency in peripheral equipment. – The student will be able to:

10.01 Demonstrate an understanding of input/output devices.
10.02 Demonstrate proficiency installing and troubleshooting serial, parallel, USB, and IEEE 1394 devices.
10.03 Demonstrate proficiency installing, configuring, and Troubleshooting video display technology eg projectors, monitors, LCD panels, data displays.
10.04 Demonstrate proficiency installing, configuring, and troubleshooting, telecommunications, network, and wireless devices.
10.05 Demonstrate proficiency installing, configuring, and troubleshooting, multimedia hardware and software.
10.06 Troubleshoot, installing hard drives and CD-R\RW\DVD.
10.07 Demonstrate proficiency installing, configuring and troubleshooting tape and other mass data storage devices.
10.08 Demonstrate proficiency installing, configuring, and troubleshooting printers.
10.09 Demonstrate professional connector assembly procedures.
10.10 Demonstrate proficiency in updating devices drivers.

Course: EEV0506
Occupational Completion Point - D (300 HOURS)
Field Service Technician/Level I - LAN Technician (SOC 15-1071)

11.0 Demonstrate proficiency in network fundamentals. – The student will be able to:

11.01 Install, connect and maintain network clients and peripherals to various network operating systems.
11.02 Demonstrate use of file systems commands and utilities on a network server.
11.03 Demonstrate setup configuring and sharing of user security, file, printer and network resources.
11.04 Demonstrate setup configuring and troubleshooting network applications on the server.
11.05 Demonstrate setup configuring and troubleshoot backup operation on server/clients.
11.06 Demonstrate proficiency in performing help desk support for a network environment.
11.07 Connect, configure, and troubleshoot devices for network connectivity.
11.08 Perform basic network system maintenance.
11.09 Describe use and system maintenance of a LAN, WAN and telecommunications system.

11.10 Perform procedures related to administration of a secure network.
11.11 Demonstrate knowledge of the Internet/Intranet/Extranet system.
11.12 Demonstrate proficiency installing, configuring and troubleshooting network protocols.
11.13 Demonstrate knowledge of telecommunications services and standards.
11.14 Install, configure and troubleshoot browsers software.

12.0 Demonstrate proficiency in network equipment and physical site requirements and considerations. – The student will be able to:

12.01 Demonstrate knowledge of data communication test equipment.
12.02 Demonstrate knowledge of telecommunication wiring systems.
12.03 Demonstrate knowledge of cable and LAN topology.
12.04 Demonstrate knowledge of broadband devices, hubs, switches and routers.
12.05 Calculate and determine and UPS requirements for an PC/network environment
12.06 Determine adequate and protected AC requirements for PC/LANs.
12.07 Calculate and determine physical requirements of a networking environment.
12.08 Install, configure and troubleshoot LAN cable systems (twisted pair, coax, or fiber).
12.09 Configure and troubleshoot patch bay and network equipment.

Course: EEV0508
Occupational Completion Point - E (450 Hours)
Digital Electronics Technician - (SOC 15-1071)

13.0 Demonstrate proficiency in advanced computer concepts. – The student will be able to:

13.01 Demonstrate knowledge of the OSI protocol model and the TCP/IP protocol.
13.02 Demonstrate use of utilities in troubleshooting a TCP/IP network
13.03 Demonstrate knowledge of TCP/IP application protocols and services, DNS, DHCP, FTP, HTTP, and LDAP
13.04 Demonstrate knowledge of simple proxy and firewall services.
13.05 Install, configure and troubleshoot the TCP/IP protocol service on a variety of operating systems.
13.06 Demonstrate knowledge of VLANs.
13.07 Install, configure and troubleshoot simple peer to peer networks.
13.08 Demonstrate knowledge of logon and logoff scripts.
13.09 Demonstrate knowledge of VPN and dial-up remote connectivity
13.10 Install and configure remote control software used in Help Desk operations.

14.0 Demonstrate proficiency in advanced operating systems. – The student will be able to:

14.01 Demonstrate knowledge of directory services in advanced operating systems.
14.02 Demonstrate knowledge of secure file systems used in an advance operating system.
14.03 Demonstrate knowledge of secure file, printer, and resource sharing in advanced operating systems.
14.04 Configure and troubleshoot access issues with secure file systems and secure file and resource sharing using advanced operating systems.
14.05 Install, configure advanced operating systems.

14.06 Troubleshoot boot, configuration, registry, and application problems typical in advanced operating systems.
14.07 Configure and troubleshoot network connectivity, protocols, network based printing.
14.08 Configure peer web-services, FTP, and telnet applications on advanced operating systems.
14.09 Schedule various preventative maintenance tasks for automatic execution in advanced operating systems.
14.10 Demonstrate knowledge of advance storage concepts, disk spanning, striping, mirroring, and striping with parity.
14.11 Configure advance storage methods using advanced operating systems.
14.12 Implement, monitor and troubleshoot security in advanced operating systems.

15.0 Demonstrate an understanding of entrepreneurship. – The student will be able to:

15.01 Identify characteristics of the American Enterprise System.
15.02 Define inflation and deflation.
15.03 Illustrate the basic economic questions facing any society.
15.04 Determine the results and change in demand or a change in supply.
15.05 List factors, which contribute to economic growth.
15.06 Identify characteristics of different types of business ownership.
15.07 Choose appropriate action in a situation requiring application of business ethics.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer Systems Technology 1**
Course Number: **8732110**
Course Credit: **1**

01.0 Demonstrate proficiency in software/hardware fundamentals. – The student will be able to:

- 01.01 Apply OS commands, syntax usage and parameters.
- 01.02 Demonstrate knowledge of OS file systems.
- 01.03 Demonstrate basic command-line/GUI OS navigation
- 01.04 Demonstrate basic operation and usage of common applications.
- 01.05 Demonstrate operation and usage of fundamental OS utilities
- 01.06 Demonstrate operation and usage of virus protection software.
- 01.07 Demonstrate operation and usage of browser software and the internet.
- 01.08 Locate and install device drivers.

16.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

- 16.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
- 16.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
- 16.03 Present information formally and informally for specific purposes and audiences. AF2.9

17.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

- 17.01 Demonstrate knowledge of arithmetic operations. AF3.2
- 17.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
- 17.03 Construct charts/tables/graphs using functions and data. AF3.5

18.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

- 18.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
- 18.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer Systems Technology 2**
Course Number: **8732120**
Course Credit: **1**

01.0 Demonstrate proficiency in software/hardware fundamentals. – The student will be able to:

- 01.09 Understand compression technologies.
- 01.10 Identify PC/server front panel controls, indicators, rear case connectors and indicators.
- 01.11 Demonstrate an understanding of the boot process.

02.0 Demonstrate proficiency in customer relations. – The student will be able to:

- 02.01 Describe and demonstrate appropriate personal hygiene and professional attire.
- 02.02 Describe and demonstrate effective listening techniques.
- 02.03 Describe and apply techniques for instilling customer confidence and satisfaction.
- 02.04 Describe and apply techniques for keeping the customer informed.
- 02.05 Describe and apply effective follow-up techniques.
- 02.06 Demonstrate discretion in interacting with customers in field and business environments.
- 02.07 Demonstrate an understanding of basic conflict resolution.

19.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

- 19.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
- 19.02 Locate, organize and reference written information from various sources. CM 3.0
- 19.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
- 19.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
- 19.05 Apply active listening skills to obtain and clarify information. CM 7.0
- 19.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
- 19.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

20.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

- 20.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
- 20.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
- 20.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
- 20.04 Conduct technical research to gather information necessary for decision-making. PS 4.0

21.0 Use information technology tools. – The student will be able to:

21.01	Use personal information management (PIM) applications to increase workplace efficiency.	IT 1.0
21.02	Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications.	IT 2.0
21.03	Employ computer operations applications to access, create, manage, integrate, and store information.	IT 3.0
21.04	Employ collaborative/groupware applications to facilitate group work.	IT 4.0

22.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

22.01	Describe the nature and types of business organizations.	SY 1.0
22.02	Explain the effect of key organizational systems on performance and quality.	
22.03	List and describe quality control systems and/or practices common to the workplace.	SY 2.0
22.04	Explain the impact of the global economy on business organizations.	

25.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

25.01	Evaluate and justify decisions based on ethical reasoning.	ELR 1.0
25.02	Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies.	ELR1.1
25.03	Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace.	ELR1.2
25.04	Interpret and explain written organizational policies and procedures.	ELR 2.0

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer Systems Technology 3**
Course Number: **8732130**
Course Credit: **1**

03.0 Demonstrate appropriate communication skills. – The student will be able to:

- 03.01 Write logical and understandable statements, or phrases, to accurately fill out forms and invoices commonly used in business and industry.
- 03.02 Read and use graphs, charts, diagrams, tables, parts manuals, and information sources commonly used in this industry/occupational area.
- 03.03 Read and follow written and oral instructions.
- 03.04 Answer and ask questions coherently and concisely.
- 03.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
- 03.06 Demonstrate appropriate telephone/communication skills.

04.0 Demonstrate employability skills. – The student will be able to:

- 04.01 Prepare a resume.
- 04.02 Conduct a job search.
- 04.03 Secure information about a job.
- 04.04 Identify and provide documents, which may be required when interviewing for a job.
- 04.05 Complete a job application form correctly and completely.
- 04.06 Demonstrate competence in job interview techniques.
- 04.07 Identify and demonstrate appropriate responses to criticism from employer, supervisor or other employees.
- 04.08 Identify and demonstrate acceptable work habits.
- 04.09 Demonstrate knowledge of how to make job changes appropriately.
- 04.10 Demonstrate knowledge of employee health issues.
- 04.11 Demonstrate efficient organizational skills.
- 04.12 Demonstrate knowledge of the “Right-To-Know Law” as recorded in (29 CFR-1910.1200).

23.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

- 23.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
- 23.02 Explain emergency procedures to follow in response to workplace accidents.
- 23.03 Create a disaster and/or emergency response plan. SHE 2.0

24.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

24.01	Employ leadership skills to accomplish organizational goals and objectives.	LT1.0
24.02	Establish and maintain effective working relationships with others in order to accomplish objectives and tasks.	LT3.0
24.03	Conduct and participate in meetings to accomplish work tasks.	LT 4.0
24.04	Employ mentoring skills to inspire and teach others.	LT 5.0

26.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

26.01	Identify and demonstrate positive work behaviors needed to be employable.	ECD 1.0
26.02	Develop personal career plan that includes goals, objectives, and strategies.	ECD 2.0
26.03	Examine licensing, certification, and industry credentialing requirements.	ECD 3.0
26.04	Maintain a career portfolio to document knowledge, skills, and experience.	ECD 5.0
26.05	Evaluate and compare employment opportunities that match career goals.	ECD 6.0
26.06	Identify and exhibit traits for retaining employment.	ECD 7.0
26.07	Identify opportunities and research requirements for career advancement.	ECD 8.0
26.08	Research the benefits of ongoing professional development.	ECD 9.0
26.09	Examine and describe entrepreneurship opportunities as a career planning option.	ECD 10.0

27.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

27.01	Identify and describe the services and legal responsibilities of financial institutions.	FL 2.0
27.02	Describe the effect of money management on personal and career goals.	FL 3.0
27.03	Develop a personal budget and financial goals.	FL3.1
27.04	Complete financial instruments for making deposits and withdrawals.	FL3.2
27.05	Maintain financial records.	FL3.3
27.06	Read and reconcile financial statements.	FL3.4
27.07	Research, compare and contrast investment opportunities.	

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer Systems Technology 4**
Course Number: **8732140**
Course Credit: **1**

05.0 Demonstrate proficiency in basic laboratory practices. – The student will be able to:

- 05.01 Apply proper Occupational Safety Health Administration (OSHA) safety standards.
- 05.02 Make electrical/voice/data connections.
- 05.03 Identify and use hand tools properly.
- 05.04 Identify and use power tools properly.
- 05.05 Demonstrate acceptable soldering and desoldering and rework and repair techniques.
- 05.06 Demonstrate electrostatic discharge (ESD) safety procedures.

06.0 Demonstrate proficiency in electronic fundamentals. – The student will be able to:

- 06.01 Solve problems utilizing metric prefixes.
- 06.02 Identify sources of electricity.
- 06.03 Define voltage, current, resistance, power and energy.
- 06.04 Apply Ohm's law and power formulas.
- 06.05 Read and interpret color codes and symbols to identify electrical/electronic components and values.
- 06.06 Measure properties of a circuit using appropriate test equipment.
- 06.07 Identify properties of an AC signal.
- 06.08 Identify AC sources.
- 06.09 Analyze and measure AC voltages using appropriate test equipment.

07.0 Demonstrate appropriate understanding of basic math. – The student will be able to:

- 07.01 Solve problems for volume, weight, area and circumference and perimeter measurements for rectangles, square and cylinders.
- 07.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, and feet and inches.
- 07.03 Add, subtract, multiply and divide using fractions, decimals and whole numbers.
- 07.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
- 07.05 Demonstrate an understanding of federal, state and local taxes and their computation.

08.0 Demonstrate appropriate understanding of basic science. – The student will be able to:

- 08.01 Demonstrate an understanding of the effects of temperature extremes and moisture content in regards to computer/network equipment.
- 08.02 Demonstrate an understanding of the impact and effects of electrostatic discharge (ESD), power surges, grounding, and lighting strikes.

08.03 Apply the scientific method to draw conclusions or make interferences from data.
08.04 Demonstrate deductive reasoning techniques when troubleshooting.
08.05 Demonstrate an understanding of the effects of heat load and ventilation in regards to computer/network equipment.
08.06 Identify safety and health related issues, including exposure to work related chemicals and hazardous materials, and demonstrate the appropriate precautionary measures.
08.07 Demonstrate an understanding of environmental impact and regulations in regards to the appropriate disposal of computer/network equipment.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer Systems Technology 5**
Course Number: **8732150**
Course Credit: **1**

09.0 Demonstrate proficiency in computer systems. – The student will be able to:

09.01 Interpret and understand computer system diagrams and technical literature.
09.02 Perform personal computer system tear-down, cleaning and inspection.
09.03 Upgrade and troubleshoot a variety of motherboards.
09.04 Demonstrate knowledge of bus systems and processor architecture.
09.05 Understand and troubleshoot memory systems.
09.06 Understand, troubleshoot and replace power supply systems.
09.07 Troubleshoot a microcomputer system.
09.08 Demonstrate system upgrading techniques.
09.09 Identify form factors: power supplies, motherboards, cases
09.10 Demonstrate proficiency in setup, configuring, upgrade and troubleshooting of laptop and mobile data devices.
09.11 Apply troubleshooting techniques using operating systems utilities.
09.12 Demonstrate the use of diagnostic software.
09.13 Install configure and troubleshooting operating systems.
09.14 Install configure and troubleshooting commonly used business applications.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer Systems Technology 6**
Course Number: **8732160**
Course Credit: **1**

10.0 Demonstrate proficiency in peripheral equipment. – The student will be able to:

10.01 Demonstrate an understanding of input/output devices.
10.02 Demonstrate proficiency installing and troubleshooting serial, parallel, USB, and IEEE 1394 devices.
10.03 Demonstrate proficiency installing, configuring, and Troubleshooting video display technology eg projectors, monitors, LCD panels, data displays.
10.04 Demonstrate proficiency installing, configuring, and troubleshooting, telecommunications, network, and wireless devices.
10.05 Demonstrate proficiency installing, configuring, and troubleshooting, multimedia hardware and software.
10.06 Troubleshoot, installing hard drives and CD-R\RW\DVD.
10.07 Demonstrate proficiency installing, configuring and troubleshooting tape and other mass data storage devices.
10.08 Demonstrate proficiency installing, configuring, and troubleshooting printers.
10.09 Demonstrate professional connector assembly procedures.
10.10 Demonstrate proficiency in updating devices drivers.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer Systems Technology 7**
Course Number: **8732170**
Course Credit: **1**

11.0 Demonstrate proficiency in network fundamentals. – The student will be able to:

- 11.01 Install, connect and maintain network clients and peripherals to various network operating systems.
- 11.02 Demonstrate use of file systems commands and utilities on a network server.
- 11.03 Demonstrate setup configuring and sharing of user security, file, printer and network resources.
- 11.04 Demonstrate setup configuring and troubleshooting network applications on the server.
- 11.05 Demonstrate setup configuring and troubleshoot backup operation on server/clients.
- 11.06 Demonstrate proficiency in performing help desk support for a network environment.
- 11.07 Connect, configure, and troubleshoot devices for network connectivity.
- 11.08 Perform basic network system maintenance.
- 11.09 Describe use and system maintenance of a LAN, WAN and telecommunications system.
- 11.10 Perform procedures related to administration of a secure network.
- 11.11 Demonstrate knowledge of the Internet/Intranet/Extranet system.
- 11.12 Demonstrate proficiency installing, configuring and troubleshooting network protocols.
- 11.13 Demonstrate knowledge of telecommunications services and standards.
- 11.14 Install, configure and troubleshoot browsers software.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer Systems Technology 8**
Course Number: **8732180**
Course Credit: **1**

12.0 Demonstrate Proficiency In Network Equipment And Physical Site Requirements And Considerations. – The student will be able to:

12.01 Demonstrate knowledge of data communication test equipment.
12.02 Demonstrate knowledge of telecommunication wiring systems.
12.03 Demonstrate knowledge of cable and LAN topology.
12.04 Demonstrate knowledge of broadband devices, hubs, switches and routers.
12.05 Calculate and determine and UPS requirements for an PC/network environment
12.06 Determine adequate and protected AC requirements for PC/LANs.
12.07 Calculate and determine physical requirements of a networking environment.
12.08 Install, configure and troubleshoot LAN cable systems (twisted pair, coax, or fiber).
12.09 Configure and troubleshoot patch bay and network equipment.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer Systems Technology 9**
Course Number: **8732190**
Course Credit: **1**

13.0 Demonstrate Proficiency In Advanced Computer Concepts. – The student will be able to:

13.01 Demonstrate knowledge of the OSI protocol model and the TCP/IP protocol.
13.02 Demonstrate use of utilities in troubleshooting a TCP/IP network
13.03 Demonstrate knowledge of TCP/IP application protocols and services, DNS, DHCP, FTP, HTTP, and LDAP
13.04 Demonstrate knowledge of simple proxy and firewall services.
13.05 Install, configure and troubleshoot the TCP/IP protocol service on a variety of operating systems.
13.06 Demonstrate knowledge of VLANs.
13.07 Install, configure and troubleshoot simple peer to peer networks.
13.08 Demonstrate knowledge of logon and logoff scripts.
13.09 Demonstrate knowledge of VPN and dial-up remote connectivity
13.10 Install and configure remote control software used in Help Desk operations.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer Systems Technology 10**
Course Number: **8732191**
Course Credit: **1**

14.0 Demonstrate Proficiency In Advanced Operating Systems. – The student will be able to:

14.01 Demonstrate knowledge of directory services in advanced operating systems.
14.02 Demonstrate knowledge of secure file systems used in an advance operating system.
14.03 Demonstrate knowledge of secure file, printer, and resource sharing in advanced operating systems.
14.04 Configure and troubleshoot access issues with secure file systems and secure file and resource sharing using advanced operating systems.
14.05 Install, configure advanced operating systems.
14.06 Troubleshoot boot, configuration, registry, and application problems typical in advanced operating systems.
14.07 Configure and troubleshoot network connectivity, protocols, network based printing.
14.08 Configure peer web-services, FTP, and telnet applications on advanced operating systems.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer Systems Technology 11**
Course Number: **8732192**
Course Credit: **1**

14.0 Demonstrate Proficiency In Advanced Operating Systems. – The student will be able to:

- 14.09 Schedule various preventative maintenance tasks for automatic execution in advanced operating systems.
- 14.10 Demonstrate knowledge of advance storage concepts, disk spanning, striping, mirroring, and striping with parity.
- 14.11 Configure advance storage methods using advanced operating systems.
- 14.12 Implement, monitor and troubleshoot security in advanced operating systems.

15.0 Demonstrate An Understanding Of Entrepreneurship. – The student will be able to:

- 15.01 Identify characteristics of the American Enterprise System.
- 15.02 Define inflation and deflation.
- 15.03 Illustrate the basic economic questions facing any society.
- 15.04 Determine the results and change in demand or a change in supply.
- 15.05 List factors, which contribute to economic growth.
- 15.06 Identify characteristics of different types of business ownership.
- 15.07 Choose appropriate action in a situation requiring application of business ethics.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Web Development**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

	Secondary	PSAV
Program Number	9001100	Y700100
CIP Number	0511080100	0511080100
Grade Level	9-12, 30, 31	30, 31
Standard Length	7 credits	1050 hours
Teacher Certification	BUS ED 1 @2 VOE @7 TEACH CBE @7 BUS DP @7 G ELECT DP @7 G CLERICAL @7 G SECRETAR @7 G STENOG @4 TEC ELEC $7 G COMP SCI 6 COMM ART @7 G WEB DEV 7 G	BUS ED 1 @2 VOE @7 TEACH CBE @7 BUS DP @7 G ELECT DP @7 G CLERICAL @7 G SECRETAR @7 G STENOG @4 TEC ELEC $7 G COMP SCI 6 COMM ART @7 WEB DEV 7 G
CTSO	FBLA BPA	Phi Beta Lambda BPA
SOC Codes (all applicable)	15-1041; 15-1099.04	15-1041; 15-1099.04
Facility Code	[212] http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)	
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp	
Basic Skills Level	N/A	Mathematics: 9.0 Language: 9.0 Reading: 9.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as an Assistant Web Designer, a Web Designer, and Senior Web Designer in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to operating system commands and web document development, design, promotion and scripting.

Program Structure

This program is a planned sequence of instruction consisting of the Business Technology Education Core and three additional occupational completion points. Secondary or postsecondary students who have previously completed the Business Technology Education Core will not have to repeat the core.

When offered at the post secondary level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44 (3)(b), F.S.

The following table illustrates the **PSAV** program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	OTA0040	Information Technology Assistant *	150	15-1041
B	CTS0070 CTS0071	Web Design Foundations Web Interface Design	150 150	15-1099.04
C	CTS0049 CTS0015	Web Scripting Web Media Integration	150 150	15-1099.04
D	CTS0016 CTS0017	Web E-commerce Web Interactivity	150 150	15-1099.04

** Note: OTA0040 is a core program.*

The following table illustrates the **Secondary** program structure:

OCP	Course Number	Course Title	Length	SOC Code	Level
A	8200320	Keyboarding and Business Skills	.5 credit	15-1061	2
		AND			
	8200330	Computer and Business Skills	.5 credit		2
		OR			
	8209020	Computing for College and Careers	1 credit		2
		OR			

OCP	Course Number	Course Title	Length	SOC Code	Level
	8207310	Introduction to Information Technology	1 credit		2
B	9001110 9001120	Foundations of Web Design User Interface Design	1 credit 1 credit	15-1099.04	3 3
C	9001130 9001140	Web Scripting Fundamentals Media Integration Essentials	1 credit 1 credit	15-1099.04	3 3
D	9001150 9001160	E-commerce & Marketing Essentials Interactivity Essentials	1 credit 1 credit	15-1099.04	3 3

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA) and Business Professionals of America (BPA) are the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills for secondary students. For postsecondary students, Phi Beta Lambda and BPA are the appropriate student organizations. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 9.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported

accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

The PSAV component of this program has no statewide articulation agreement approved by the Articulation Coordinating Committee. However, this does not preclude the awarding of credits by any college through local agreements.

For details on articulation agreements which correlate to programs and industry certifications refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Bright Futures/Gold Seal Scholarship

Course substitutions as defined in the Comprehensive Course Table for this program area may be used to qualify a student for Florida's Gold Seal Vocational Scholarship, providing all other eligibility requirements are met. Eligibility requirements are available online at https://www.osfaffelp.org/bfiehs/fnbpcm02_CCTMain.aspx.

Fine Arts/Practical Arts Credit

Many courses in CTE programs meet the Fine Arts/Practical Arts credit for high school graduation. For additional information refer to http://www.fldoe.org/schools/pdf/ListPracticalArtsCourses.pdf.

Standards

After successfully completing this program, the student will be able to perform the following:

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning though job shadowing, mentoring, e-coaching, etc.
08.0 Demonstrate personal and interpersonal skills appropriate for the workplace.
09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use Technology to apply and enhance communications skills in technical reading, writing.
04.0 Practice quality performance in the learning environment and the workplace.
05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
09.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
11.0 Perform e-mail activities.
12.0 Demonstrate operating systems.
13.0 Develop an awareness of emerging technologies.

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance and enhance personal performance in relation to the workplace. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal and professional ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
10.0 Demonstrate personal and interpersonal skills and attributes appropriate for the workplace.
11.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
12.0 Perform e-mail activities.
13.0 Demonstrate operating systems.
14.0 Develop an awareness of emerging technologies.

OR

Introduction to IT Competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.
02.0 Demonstrate Comprehension and communication skills.
03.0 Use technology to enhance the effectiveness of communication skills.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.
10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
11.0 Participate in work-based learning experiences.
12.0 Perform e-mail activities.
13.0 Demonstrate knowledge of different operating systems.
14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW.
15.0 Demonstrate proficiency using HTML commands.
16.0 Demonstrate proficiency in page design applicable to the WWW.
17.0 Demonstrate proficiency using specialized web design software.
18.0 Develop an awareness of the information technology industry.
19.0 Develop an awareness of microprocessors and digital computers.
20.0 Develop an awareness of programming languages.
21.0 Develop an awareness of emerging technologies.
22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model.
23.0 Demonstrate proficiency using common software applications.
24.0 Demonstrate proficiency using specialized software applications.

Program Standards

25.0 Demonstrate proficiency in website planning and the design process.
26.0 Develop markup language structures.
27.0 Create basic webpages.
28.0 Incorporate images and graphical formatting on a webpage.
29.0 Create a basic table structure.
30.0 Incorporate form structures in a webpage.
31.0 Describe frame structures and their usage.
32.0 Use Cascading Style Sheets (CSS).
33.0 Examine web design technologies and techniques.
34.0 Describe the process for publishing a website.
35.0 Describe how website performance is monitored and analyzed.
36.0 Create an informational website.
37.0 Incorporate Human Computer Interface (HCI) principles of design.
38.0 Research and obtain information for use in designing the user interface.
39.0 Create an intuitive interface using Cascading Style Sheets (CSS).
40.0 Demonstrate proficiency creating a logical website file structure.
41.0 Create a CSS formatted informational website.
42.0 Demonstrate proficiency publishing, testing, monitoring, and maintaining a website.
43.0 Discuss the differences between server-side and client-side scripting.
44.0 Compare and contrast client-side scripting languages (JavaScript, VBScript, and ECMAScript).
45.0 Demonstrate understanding of the Document Object Model (DOM).
46.0 Design, write, debug, and incorporate a JavaScript client-side script into a webpage.
47.0 Incorporate basic JavaScript form validation and form handling (using pre-built validation scripts or online libraries).
48.0 Use advanced JavaScript techniques.
49.0 Demonstrate understanding of JavaScript accessibility issues.
50.0 Select and modify appropriate library and pre-built JavaScript to incorporate into webpage.
51.0 Incorporate graphics, animations, and video assets into a webpage design using conventional HTML techniques.
52.0 Demonstrate understanding of XML vocabularies and documents.
53.0 Create and debug an XML Document.
54.0 Create and debug compound documents with Namespaces.
55.0 Demonstrate ability to validate documents with a Data Type Definition (DTD).
56.0 Demonstrate ability to validate documents with XML Schema.
57.0 Demonstrate an understanding of Asynchronous JavaScript And XML (AJAX) and its implications for web developers.
58.0 Plan and implement a multi-page website that features graphics, pictures, and video galleries using AJAX techniques.
59.0 Demonstrate knowledge and skills necessary to setup a secure E-commerce site.
60.0 Identify security issues associated with e-commerce and discuss methods to mitigate risks.
61.0 Apply skills necessary to setup an E-commerce storefront.
62.0 Employ techniques to enhance the value and profitability of an E-commerce website.
63.0 Develop an evaluation and performance monitoring framework featuring established metrics and target goals for an E-commerce website.
64.0 Demonstrate an understanding of Content Management Systems (CMS) and their implications for web development.

65.0 Use CMS features, functions, and extensions/modules to create/enhance a website.
66.0 Evaluate the suitability for and system requirements for a content management system.
67.0 Demonstrate an understanding of multimedia applications and their implications for web designers.
68.0 Create and incorporate interactive website components.
69.0 PDF document usage considerations.
70.0 Create, format, and manipulate PDF documents.
71.0 Display, distribution, and print considerations for PDF documents.
72.0 Create and manage PDF forms.
73.0 Incorporate PDF security in a PDF document.
74.0 Demonstrate proficiency using HTML5 features and functions.
74.0 Demonstrate language arts knowledge and skills.
75.0 Demonstrate mathematics knowledge and skills.
76.0 Demonstrate science knowledge and skills.
77.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
78.0 Solve problems using critical thinking skills, creativity and innovation.
79.0 Use information technology tools.
80.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
81.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
82.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
83.0 Describe the importance of professional ethics and legal responsibilities.
84.0 Explain the importance of employability skill and entrepreneurship skills.
85.0 Demonstrate personal money-management concepts, procedures, and strategies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Web Development**
PSAV Number: **Y700100**

Course Number: OTA0040
Occupational Completion Point – A
Information Technology Assistant – 150 Hours – SOC Code 15-1041

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Demonstrate basic file management skills.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 03.01 Select and use word processing software and accompanying features to enhance written business communications.
- 03.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.
- 03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

07.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
07.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
07.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
07.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

08.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

08.01 Accept constructive criticism.
08.02 Apply appropriate strategies to manage and resolve conflict in work situations.
08.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

09.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
09.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic file management skills.
01.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

02.01 Take notes, organize, summarize, and paraphrase ideas and details.
02.02 Accurately follow written and oral instructions.
02.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
03.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

04.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
04.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

05.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
05.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
05.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
06.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
06.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

07.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
07.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

07.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

08.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
08.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
08.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
08.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
08.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
08.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
08.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
08.08 Build mentor relationships with local professionals in the industry.

09.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

09.01 Accept constructive criticism.
09.02 Apply appropriate strategies to manage and resolve conflict in work situations.
09.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

10.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

11.0 Perform e-mail activities. – The student will be able to:

11.01 Describe e-mail capabilities and functions.
11.02 Use the Internet to perform e-mail activities.

12.0 Demonstrate operating systems. – The student will be able to:

12.01 Identify operating system file naming conventions.

12.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
12.03 Demonstrate a working knowledge of standard file formats.
12.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

13.0 Develop an awareness of emerging technologies. – The student will be able to:

13.01 Compare and contrast various methods of evaluation for emerging technologies.
13.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
13.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic computer file management skills.
01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills.

02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
02.02 Write clear and well-organized research papers, integrating a variety of information.
02.03 Prepare and deliver an oral report with appropriate materials to the class
02.04 Participate in large group discussions as a member and/or a leader.
02.05 Take notes, organize, summarize, and paraphrase ideas and details.
02.06 Accurately follow written and oral instructions.
02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills.

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles.

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace.

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.

08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.

09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.

10.01 Accept constructive criticism.
10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.
10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance.

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities.

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems.

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies.

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Introduction to Information Technology competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills.

02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.

02.02 Use professional business vocabulary appropriate for information technology environments.
02.03 Organize ideas and communicate oral and written messages appropriate for information technology environments.
02.04 Collaborate with individuals and teams to complete tasks and solve information technology problems.
02.05 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
02.06 Apply the writing process to the creation of appropriate documents following designated business formats.
02.07 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills.

03.01 Use database, spreadsheet, and presentation software, scheduling, and integrated software packages to enhance communication.
03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles.

04.01 Explore, design, implement, and evaluate organizational structures and cultures.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace.

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations;

accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.

- 08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.

- 09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
- 09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
- 09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
- 09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
- 09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.

- 10.01 Accept constructive criticism.
- 10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences.

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities.

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.
12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.
12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems.

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW.

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using HTML commands.

15.01 Identify elements of a Webpage.

15.02 Describe individual Webpage layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Webpages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Webpages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance webpages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the WWW.

16.01 Develop an awareness of acceptable Webpage design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Webpage design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to webpages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software.

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry.

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers.

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.

19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages.

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies.

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model.

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software

23.0 Demonstrate proficiency using common software applications.

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications.

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)

24.03 Demonstrate the ability to incorporate digital sound.

Course Number: CTS0070 (Web Design Foundations)
Occupational Completion Point – B
Assistant Web Designer – 300 Hours – SOC Code 15-1099.04

25.0 Demonstrate proficiency in website planning and the design process.

25.01 Define information architecture.
25.02 Discuss the importance of information architecture to web design and development.
25.03 Conduct a client interview to determine the business purpose of the new web site and the primary goals.
25.04 Conduct a competitive analysis.
25.05 Identify stages in the web design process and describe the activities comprising each stage.
25.06 Define the site structure by creating a content map, storyboard, and associated wireframes.
25.07 Create a global site map.
25.08 Discuss the legal and ethical issues related to web design.
25.09 Describe accessibility and its implications on web design.
25.10 Create a web site mock-up for client approval.

26.0 Develop markup language structures.

26.01 Define common markup languages and their usage.
26.02 Examine emerging and new markup languages.
26.03 Determine browser support and appropriate usage of markup languages (existing and emerging).
26.04 Identify common DOCTYPES (e.g., Strict, Transitional and Frameset) and describe their appropriate use.

27.0 Create basic webpages.

27.01 Create basic webpage structures using common markup elements and attributes.
27.02 Incorporate list structures in a webpage (i.e., ordered, unordered, definition, nested).
27.03 Incorporate link structures in a webpage (i.e., external, internal, email).
27.04 Research and incorporate web color usage principles in a webpage.
27.05 Troubleshoot markup language syntax, elements, and links.

28.0 Incorporate images and graphical formatting on a webpage.

28.01 Describe usage guidelines (e.g., format types, size, relevance) for integrating images and graphics onto a webpage.
28.02 Compare and contrast standard image formats used in webpage design.
28.03 Incorporate graphics into a webpage design.
28.04 Create and incorporate image maps in a webpage.
28.05 Optimize images and graphics for use in a webpage.

29.0 Create a basic table structure.

29.01 Describe how tables are used in web design.
29.02 Discuss the advantages and disadvantages of incorporating tables in a webpage design.
29.03 Define and modify table structures for the presentation of tabular information.
29.04 Create accessible tables using standard table elements and attributes.

30.0 Incorporate form structures in a webpage.

30.01 Create an accessible form using common elements, including form, fieldset, legend, textarea, select, option, button, and input (radio, checkbox, submit, reset, image, password, hidden).
30.02 Describe and diagram the relationship between XHTML forms and server-side technologies.
30.03 Compare and contrast the GET and POST methods for forms handling.
30.04 Define form validation and describe how it is accomplished
30.05 List popular server-side technologies often used to process content sent from XHTML forms.
30.06 Use labels with form elements.
30.07 Connect a XHTML form to a server-side script for processing.

31.0 Describe frame structures and their usage.

31.01 Explore frame and iframe structures and support issues.
31.02 Describe appropriate uses of iframes.
31.03 Incorporate frame structure in a webpage.

32.0 Use Cascading Style Sheets (CSS).

32.01 Define CSS and describe its importance in web design.
32.02 Compare and contrast existing and emerging CSS versions.
32.03 Determine browser support and appropriate usage of CSS (existing and emerging versions).
32.04 Explain "document flow" and describe its implications on web design.
32.05 Recognize and use element selectors, ID selectors, class selectors, pseudo-class selectors, and descendant selectors.
32.06 Explain how inheritance and specificity affect CSS rule conflicts.
32.07 Use inline styles, embedded style sheets, and external style sheets.
32.08 Use the link and import methods to connect to an external style sheet.
32.09 Use CSS shorthand techniques to create efficient and concise style sheets.
32.10 Apply basic CSS properties, including background, border, clear, color, float, font, height, line-height, list-style, margin, overflow, padding, position, text-align, text-indent, width, z-index, padding, et al.
32.11 Use CSS to style tables (e.g., borders, width, spacing, alignment, background).
32.12 Use CSS to enhance the appearance and usability of an XHTML form.

33.0 Examine web design technologies and techniques.

33.01 Compare and contrast common authoring tools.
33.02 Compare and contrast client-side and server-side technologies.
33.03 Define e-commerce types and usage.

33.04 Describe database connectivity relative to websites.
33.05 Identify technologies to enhance user experience.

34.0 Describe the process for publishing a website.

34.01 Explore domain name selection principles.
34.02 Identify process to registering a domain name.
34.03 Compare and contrast hosting providers, features, and selection criteria.
34.04 Describe the various means for uploading website files (e.g., FTP, web-based tools, etc.).

35.0 Describe how website performance is monitored and analyzed.

35.01 Identify issues related to website maintenance.
35.02 Use webpage validation tools.
35.03 Describe website performance metrics (e.g., visits, time-on-page, time-on-site, et al) and discuss their design implications.
35.04 Demonstrate knowledge of accessibility problems and solutions.
35.05 Examine indexing, page ranking, basic Search Engine Optimization techniques.
35.06 Explore common website analytic tools.

36.0 Create an informational website.

36.01 Use GUI (Graphical User Interface) web authoring software to create a multi-page informational website.
36.02 Use image-editing software to enhance website designs with simple graphics.
36.03 Use animation software to enhance website designs.
36.04 Enhance the website using client-side technologies (rollovers, check plug-ins, pop-up windows).
36.05 Demonstrate efficient, consistent web site development practice (use of templates, snippets, etc).

74.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

74.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
74.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
74.03 Present information formally and informally for specific purposes and audiences. AF2.9

75.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

75.01 Demonstrate knowledge of arithmetic operations. AF3.2
75.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
75.03 Construct charts/tables/graphs using functions and data. AF3.5

76.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

76.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1

76.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

Course Number: CTS0071 (Web Interface Design)
Occupational Completion Point – B
Assistant Web Designer – 300 Hours – SOC Code 15-1099.04

37.0 Incorporate Human Computer Interface (HCI) principles of design.

37.01 Describe the fundamental design principles of human computer interface.
37.02 Differentiate between computer and human factors in screen/page design.
37.03 Describe what is meant by an "intuitive" interface.
37.04 Describe how typography, color scheme, and graphic usage are used to set website feel/tone for various types of websites (e.g., educational, entertainment, ecommerce).Identify and use the following design concepts: contrast, repetition, alignment, proximity, writing style.
37.05 Identify and use the following design concepts: contrast, repetition, alignment, proximity, writing style.
37.06 Define and establish logo, identity, and branding needed for an effective website.
37.07 Evaluate the HCI features included on a webpage storyboard.
37.08 Create a series of webpage storyboards that incorporate HCI design principles.

38.0 Research and obtain information for use in designing the user interface.

38.01 Identify common user information needs, information gathering models, and methods for gathering user research.
38.02 Define the primary audience and customer expectations and develop a rubric for defining user tasks and corresponding functionality.
38.03 Describe target audience preferences based on demographics (e.g., gender, age, economic status, culture, et al).
38.04 Identify and use web analytic tools to shape an information architecture strategy (determine keywords, etc.).
38.05 Apply the results of research and analytics to the design of a user interface.

39.0 Create an intuitive interface using Cascading Style Sheets (CSS).

39.01 Create CSS styles suitable for use on an intuitive webpage interface.
39.02 Use element selectors, ID selectors, class selectors, pseudo-class selectors, and descendant selectors to create a table-less webpage design
39.03 Create a series of templates formatted exclusively using CSS.
39.04 Use CSS syntax to configure and apply style sheets for multiple media displays (e.g., screen display and print).
39.05 Create webpage templates using advanced CSS methods (e.g., create multi-column layouts, mimic client-side technologies, create faux columns, etc.).
39.06 Differentiate among static, relative, absolute, and fixed positioning schemas.
39.07 Use schemas to design a website: fixed, liquid, elastic designs.
39.08 Recognize browser support for static, relative, absolute, and fixed positioning schemas.
39.09 Identify and correct display issues in a web page using multiple browsers.

40.0 Demonstrate proficiency creating a logical website file structure.

- 40.01 Create an efficient, maintainable directory structure for a website, including the site root and subfolders for assets (e.g., images, templates, CSS, et al.).
- 40.02 Demonstrate and use correct file paths for relative, site root relative, and absolute links.

41.0 Create a CSS formatted informational website.

- 41.01 Use GUI (Graphical User Interface) web authoring software to create a multi-page informational website.
- 41.02 Create documented CSS style sheets for layout and appearance purposes.
- 41.03 Incorporate methods used to drive traffic to the website, then engage and retain visitors.
- 41.04 Apply standard optimization practices (e.g., keyword proximity; density; relevance; appropriate page titles, URLs, and headings, alt tags; et al) to enhance search engine performance.
- 41.05 Use standard design techniques to correctly display a website using multiple browsers (e.g., box model, hasLayout, Internet Explorer Conditional Comments (IECC)).
- 41.06 Integrate common multimedia and plug-ins as appropriate to enhance a website design.
- 41.07 Use client-side technologies such as rollovers, check plug-ins, and pop-up windows to enhance the user interface.

42.0 Demonstrate proficiency publishing, testing, monitoring, and maintaining a website.

- 42.01 Recognize the relationship between local and remote site structure.
- 42.02 Identify methods of acquiring a domain name, appropriate hosting, and search engine registry.
- 42.03 Understand and implement strategies to measure website traffic and improve search engine analytics reports.
- 42.04 Describe the use of standard web marketing technologies (e.g., blogging, podcasting, et al).
- 42.05 Describe how social media and social networking sites can be used for marketing purposes.
- 42.06 Test websites using common resolutions, browsers, accessibility, and validation techniques.
- 42.07 Use popular Internet browsers and tools as defined by W3C Browser Statistics (e.g., Mozilla Firefox (Web Developer Toolbar, ColorZilla, MeasureIt, Firebug), Internet Explorer 7/8) to display and troubleshoot websites.
- 42.08 Explore standard practices for feedback and usability testing
- 42.09 Identify and incorporate standard security measures in a website.
- 42.10 Identify and use online validation tools.
- 42.11 Successfully change invalid markup to comply with standards.
- 42.12 Build a webpage that successfully passes the W3C validation test at http://validator.w3.org.
- 42.13 Write markup that facilitates accessibility.
- 42.14 Use FTP to transfer files to a server.
- 42.15 Set up an FTP connection to a remote site and reproduce the site structure on the server.

77.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

77.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
77.02 Locate, organize and reference written information from various sources. CM 3.0
77.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
77.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
77.05 Apply active listening skills to obtain and clarify information. CM 7.0
77.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
77.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

78.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

78.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
78.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
78.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
78.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

79.0 Use information technology tools. – The student will be able to:

79.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
79.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
79.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
79.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

80.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

80.01 Describe the nature and types of business organizations. SY 1.0
80.02 Explain the effect of key organizational systems on performance and quality.
80.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
80.04 Explain the impact of the global economy on business organizations.

83.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

83.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
83.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1

83.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
83.04 Interpret and explain written organizational policies and procedures. ELR 2.0

Course Number: CTS0049 (Web Scripting)
Occupational Completion Point – C
Web Designer – 300 Hours – SOC Code 15-1099.04

43.0 Discuss the differences between server-side and client-side scripting.

43.01 Describe the role scripting languages play in the creation of websites.
43.02 Identify and describe the advantages, disadvantages, and primary uses of popular scripting languages (e.g., JavaScript, VBScript, Perl, PHP, JScript, et al).

44.0 Compare and contrast client-side scripting languages (JavaScript, VBScript, and ECMAScript).

44.01 Describe the primary usage and limitations of JavaScript in a web environment.
44.02 Describe how JavaScript blends with other web-authoring technologies (i.e., HTML, CSS, Server-side programming, Plug-ins, etc.).
44.03 Describe the primary differences between JavaScript and VBScript.
44.04 Describe the source, features, and common uses of ECMAScript.
44.05 Explain why JavaScript use far exceeds VBScript for client-side scripting.
44.06 Research resources available to advance JavaScript knowledge.
44.07 Explore emerging trends and upcoming revisions related to JavaScript.

45.0 Demonstrate understanding of the Document Object Model (DOM).

45.01 Describe the purpose of the Document Object Model (layout, objects, properties, and methods).
45.02 Describe how JavaScript uses the DOM to detect and manipulate elements on a webpage.

46.0 Design, write, debug, and incorporate a JavaScript client-side script into a webpage.

46.01 Write, analyze and explain JavaScript syntax.
46.02 Describe usage of various data types.
46.03 Describe how the use of decision-making logic (AND, OR) is employed in a JavaScript program.
46.04 Create and use variables, operators, and expressions.
46.05 Use common JavaScript events and event handlers (e.g., click, load, onClick, onLoad) to control program flow, appearance, or functionality.
46.06 Understand and incorporate JavaScript arrays (e.g., array basics, types, usage, methods, sorting).
46.07 Understand and incorporate JavaScript functions (e.g., using the DOM, pass a value, return value, create objects, work with classes and objects).
46.08 Understand and incorporate JavaScript loops and conditions (e.g., loop basics, types, usage).
46.09 Recognize, isolate, and correct common JavaScript errors (e.g., syntax, function errors, reserved word usage, unsupported DOM).

46.10 Identify limitations related to obsolete JavaScript constructs and coding practices (e.g., Document.all, navigator.appName).
46.11 Apply JavaScript best coding practices (i.e., properly documenting scripts, field naming conventions, writing understandable code).
46.12 Use different methods to incorporate JavaScript onto a web page (e.g., <script> element, JavaScript statement block, external scripts).
46.13 Troubleshoot and test incorporated script (i.e., functionality, browser usage, resolve known bugs).

47.0 Incorporate basic JavaScript form validation and form handling (using pre-built validation scripts or online libraries).

47.01 Identify and use form elements to solicit user input.
47.02 Use JavaScript with HTML form controls.
47.03 Validate web forms prior to submission.
47.04 Use output commands to display processed data in an appropriately formatted form.

48.0 Use advanced JavaScript techniques.

48.01 Write JavaScript suitable for plug-in detection, image manipulation, and the creation of custom JavaScript objects.
48.02 Use JavaScript to incorporate, create, update, and delete cookies.
48.03 Describe the common security issues relevant to JavaScript.

49.0 Demonstrate understanding of JavaScript accessibility issues.

49.01 Describe the purpose of the Browser Object Model (BOM) and how it relates to JavaScript.
49.02 Describe how obsolete constructs and coding practices affect browser function.
49.03 Make webpages accessible and functional when JavaScript disabled or unsupported.
49.04 Demonstrate ability to use XHTML, HTML, and CSS instead of JavaScript where appropriate.
49.05 Demonstrate ability to determine which version of JavaScript specific browsers support and code program to meet acceptable standards.

50.0 Select and modify appropriate library and pre-built JavaScript to incorporate into webpage.

50.01 Explore common JavaScript libraries and describe the advantages & disadvantages of using libraries.
50.02 Analyze pre-built library items to determine functionality.
50.03 Explain how a library item achieves desired processing.
50.04 Determine if pre-built script provides functionality required in an effective manner.
50.05 Incorporate pre-built library items into web pages.
50.06 Identify the restrictions related to using pre-built scripts (i.e.; copyright, processing, and length of script).
50.07 Modify pre-built scripts to suit functionality requirements.
50.08 Test and troubleshoot pre-built scripts and widgets incorporated into web pages.

81.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

81.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
81.02 Explain emergency procedures to follow in response to workplace accidents.
81.03 Create a disaster and/or emergency response plan. SHE 2.0

82.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

82.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
82.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
82.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
82.04 Employ mentoring skills to inspire and teach others. LT 5.0

84.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

84.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
84.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
84.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
84.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
84.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
84.06 Identify and exhibit traits for retaining employment. ECD 7.0
84.07 Identify opportunities and research requirements for career advancement. ECD 8.0
84.08 Research the benefits of ongoing professional development. ECD 9.0
84.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

85.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

85.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
85.02 Describe the effect of money management on personal and career goals. FL 3.0
85.03 Develop a personal budget and financial goals. FL3.1
85.04 Complete financial instruments for making deposits and withdrawals. FL3.2
85.05 Maintain financial records. FL3.3
85.06 Read and reconcile financial statements. FL3.4
85.07 Research, compare and contrast investment opportunities.

Course Number: CTS0015 (Web Media Integration)
Occupational Completion Point – C
Senior Web Designer – 300 Hours – SOC Code 15-1099.04

51.0 Incorporate graphics, animations, and video assets into a webpage design using conventional HTML techniques.

51.01 Use the HREF tag to integrate a video file displayed in a new window.
51.02 Use the EMBED tag to display a graphic animation or a video file as part of the webpage fabric.
51.03 Discuss the limitations of conventional media integration techniques.

52.0 Demonstrate understanding of XML vocabularies and documents.

52.01 Understand XML vocabularies.
52.02 Define well-formed and valid XML documents.
52.03 Describe the basic structure of an XML document.

53.0 Create and debug an XML Document.

53.01 Create an XML declaration.
53.02 Work with XML comments.
53.03 Create XML elements and attributes.
53.04 Work with character and entity references.
53.05 Describe how XML handles character data, parsed character data, and white space.
53.06 Work with XML parsers.
53.07 Understand how Web browsers work with XML documents.
53.08 Apply a style sheet to an XML document.
53.09 Create an XML processing instruction.

54.0 Create and debug compound documents with Namespaces.

54.01 Understand compound documents and the problem of name collision.
54.02 Declare a namespace for an XML vocabulary.
54.03 Apply a namespace to an element.
54.04 Create a default namespace.
54.05 Apply a namespace to an attribute.
54.06 Declare a namespace within a CSS style sheet.
54.07 Apply a namespace to a style selector.
54.08 Use the escape character to apply a namespace to a selector.
54.09 Create a compound document containing XML and XHTML elements and attributes.

55.0 Demonstrate ability to validate documents with a Data Type Definition (DTD).

55.01 Understand the principles of data validation.
55.02 Create a DOCTYPE.
55.03 Specify the content of an XML element.
55.04 Define the structure of child elements.
55.05 Describe how DOCTYPE changed from HTML4.01 to HTML5.

56.0 Demonstrate ability to validate documents with XML Schema.

56.01 Compare schemas and DTDs.
56.02 Explore different schema vocabularies.
56.03 Declare simple type elements and attributes.

56.04 Declare complex type elements.
56.05 Apply a schema to an instance document.
56.06 Work with XML Schema data types.
56.07 Derive new data types for text strings, numeric values, and dates.
56.08 Create data types for patterned data using regular expressions.
56.09 Explore different schema structures.
56.10 Attach a schema to a namespace.
56.11 Validate compound instance documents.
56.12 Import one schema file into another.

57.0 Demonstrate an understanding of Asynchronous JavaScript And XML (AJAX) and its implications for web developers.

57.01 Identify the technologies that comprise AJAX and explain how they interact.
57.02 Describe the purpose, advantages, disadvantages, and functions of AJAX.
57.03 Describe how AJAX works and how it is used in the creation of websites.
57.04 Identify AJAX requirements.
57.05 Install and setup the AJAX Control Toolkit.
57.06 Define appropriate use of AJAX in a web project.
57.07 Identify AJAX Usability and Accessibility issues and their workarounds.
57.08 Describe AJAX related browser compatibility issues and their workarounds.
57.09 Explore popular AJAX applications currently on the Internet (auto-complete (Google), updating user content (Twitter), voting and rating (social bookmarking))
57.10 Describe common security issues associated to AJAX
57.11 Analyze the server-side implications of AJAX applications
57.12 Explore methods for testing and maintaining an AJAX application.
57.13 Explore the future of AJAX and its implementation.

58.0 Plan and implement a multi-page website that features graphics, pictures, and video galleries using AJAX techniques.

58.01 Research AJAX design principles and patterns (e.g., Observer, Command and MVC).
58.02 Research and compare popular AJAX frameworks, libraries, and toolkits (e.g., JQuery, DOJO, Prototype, et al).
58.03 Identify and implement methods of using AJAX when JavaScript not available (e.g. progressive enhancement).
58.04 Update specific areas of a page with data from the server (e.g., server-login updated) without reloading the webpage.
58.05 Demonstrate the ability to output results in different formats (e.g., XML, JSON, alternatives to JavaScript).
58.06 Use AJAX to create form submission & validation (e.g. password strength check, email/URL validation).
58.07 Integrate a basic slideshow via lightbox using AJAX techniques.
58.08 Integrate optional video selections displayed using AJAX techniques.

Course Number: CTS0016 (Web E-commerce)
Occupational Completion Point – D
Senior Web Designer – 300 Hours – SOC Code 15-1099.04

59.0 Demonstrate knowledge and skills necessary to setup a secure E-commerce site.

59.01 Compare and contrast popular pre-built shopping cart software (e.g., PrestaShop, Zend Cart).
59.02 Compare and contrast hosting options available for use with shopping cart software (i.e., shared hosting or dedicated server).
59.03 Discuss shopping cart vulnerabilities and best-practice preventative measures.
59.04 Identify hardware and software necessary to install and setup pre-built shopping cart software.
59.05 Install and configure necessary software (database, server, etc.) to run pre-built shopping cart software.
59.06 Install and configure pre-built shopping cart software.
59.07 Verify database and server connectivity.
59.08 Test and troubleshoot setup/configuration issues.

60.0 Identify security issues associated with e-commerce and discuss methods to mitigate risks.

60.01 Describe the differences between Transaction Layer Security (TLS) and its predecessor, Secure Sockets Layer (SSL).
60.02 Explain transaction security.
60.03 Identify security and payment processing issues involved in developing a site (e.g., SSL, Digital Certificates, SET Protocol, Cyber Cash).
60.04 Demonstrate understanding of https and htaccess and their usage.
60.05 Explore methods to obtain an SSL certificate and secure transactions.
60.06 Compare and contrast the appropriateness of employing a merchant account or a payment gateway to handle online transactions.
60.07 Discuss the process, advantages, disadvantages, and costs associated with opening a merchant account.
60.08 Describe the process, advantages, disadvantages, and costs associated with using a payment gateway.

61.0 Apply skills necessary to setup an E-commerce storefront.

61.01 Setup and use an FTP (File Transfer Protocol) program to transfer files to a web server.
61.02 Add business specific information to site storefront (e.g., logos, product images, descriptions, et al).
61.03 Setup back-end site administration functions and navigation.
61.04 Setup a schema for incorporating shipping, handling, and processing fees based on carrier, geographical zones, and weight/price range.
61.05 Experiment with various add-ons, themes, and modules available for customization.
61.06 Customize shopping cart to suit client needs (e.g., modify fields, add buttons, etc.).
61.07 Customize forms to accommodate client products and/or services.
61.08 Setup Search preferences and functionality for products and/or services.
61.09 Setup customer contact preferences and email notification functionality.
61.10 Apply Search Engine Optimization (SEO) techniques to shopping cart pages.
61.11 Test operation of shopping cart pages in multiple browsers.
61.12 Troubleshoot issues and errors related to browser display and functionality.

62.0 Employ techniques to enhance the value and profitability of an E-commerce website.

62.01 Determine business goals for the e-commerce site.
62.02 Identify the various types of advertising options in e-commerce (e.g., links, banner ads, affiliate programs, pop-up windows, viral marketing, newsgroup postings, et al).
62.03 Describe affiliate marketing and its implications for e-commerce websites.
62.04 Analyze popular affiliate programs/networks and available payment schemes.
62.05 Explain the differences, advantages, and disadvantages of CPM, PPC, and Pay per Sale/Lead.
62.06 Determine appropriate affiliate program for target audience.
62.07 Identify the method to join an affiliate program/network.
62.08 Identify considerations/ requirements of selecting an affiliate program.
62.09 Determine appropriate number of affiliate programs necessary to suit client site.
62.10 Determine the terms and conditions of sale, including warranties, after-sales service, and privacy assurances.
62.11 Determine customer service options (e.g., e-mail, phone, fax).
62.12 Create a site map.
62.13 Create a Frequently Asked Questions (FAQ) page.
62.14 Create a product/version comparison chart, where appropriate.
62.15 Create feedback, review, survey, and recommendation pages.

63.0 Develop evaluation and performance monitoring metrics and target goals for an E-commerce website.

63.01 Research existing and emerging analytical, usability, SEO tools to improve customer satisfaction and site conversion rates.
63.02 Describe web analytics tools and their features/functions.
63.03 Use web analytics tools to determine optimum site keywords.
63.04 Experiment with using advanced segments to view subsets of data (relating to purchasing habits, website usage, searches).
63.05 Customize analytic reports using appropriate metrics (e.g., average per-visit value, bounce rates, time spent on page, et al).
63.06 Create more concise reports using advanced filters in web analytics tools.
63.07 Use intelligence features of web analytics tools to discover patterns of usage and setup corresponding alerts.
63.08 Research popular mobile analytics tools (e.g., Motally, et al) and their features.
63.09 Interpret analytic report data and optimize website accordingly, if appropriate.

Course Number: CTS0017 (Web Interactivity)
Occupational Completion Point – D
Senior Web Designer – 300 Hours – SOC Code 15-1099.04

64.0 Demonstrate an understanding of Content Management Systems (CMS) and their implications for web development.

64.01 Describe the fundamental operation of a CMS.
64.02 Describe the typical features of a content management system.
64.03 Compare and contrast popular CMS applications (e.g., WordPress, Joomla, et al).
64.04 Describe how a content management system can be used to enhance website interactivity.

64.05 Demonstrate proficiency installing and configuring content management systems and extensions/modules.

65.0 Use CMS features, functions, and extensions/modules to create/enhance a website.

65.01 Create a basic multipage website using a content management system.
65.02 Enhance a webpage by using a content management system to incorporate images, animations, or video segments.
65.03 Incorporate a blog feature into a website using a content management system.
65.04 Demonstrate proficiency using CMS built-in security for website, password and database backup.
65.05 Demonstrate proficiency using add-on modules, or plug-ins.

66.0 Evaluate the suitability for and system requirements for a content management system.

66.01 Identify business goals and evaluate their suitability for a content management system.
66.02 Determine web hosting system requirements.
66.03 Create a schema for creating, deleting, and managing users and their permissions.
66.04 Discuss the value represented by templates in a content management system development environment.

67.0 Demonstrate an understanding of multimedia applications and their implications for web designers.

67.01 Compare and contrast the leading multimedia development applications for website development (e.g., Adobe Flash, Microsoft Silverlight, et al).
67.02 Describe those circumstances whereby multimedia may be used to add interactivity to a website.
67.03 Describe the limitations of multimedia development applications relative to website development.

68.0 Create and incorporate interactive website components.

68.01 Create buttons, menus, and other components that feature a static, hover, and rollover effect.
68.02 Convert original artwork into an interactive component with associated script behavior.
68.03 Adjust the component properties including opacity, filter, rotation, and action.
68.04 Resize a multi-layer component to ensure uniform resizing of each layer.
68.05 Create scrolling images, panels, and lists for incorporating into a web design.
68.06 Create and incorporate animated banners, headers, and website introduction pages (e.g., Adobe Flash, Microsoft Silverlight).

69.0 PDF document usage considerations.

69.01 Discuss the advantages and disadvantages of using PDF documents in a web site.
69.02 Research and discuss PDF document usage best practices.

69.03 Determine when it is appropriate to use PDF documents (e.g., brochure downloads, large reports, catalogs, interactive forms).
69.04 Compare and contrast the functionality of software applications used to create and process PDFs.
69.05 Research and describe search engine optimization considerations related to the use of PDF documents.
69.06 Research and discuss security issues related to PDF document usage in a web site (viruses, auto-open).
69.07 Identify accessibility issues related to using PDF documents in a web site.

70.0 Create, format, and manipulate PDF documents.

70.01 List and describe the methods available for creating PDF documents.
70.02 Create a PDF using a variety of software applications, multiple files, and web pages.
70.03 Demonstrate ability to format, modify and enhance a PDF document.
70.04 Describe the differences in PDF standards for document prepress data interchange and long-term archiving.
70.05 Embed images, text, audio, video, and Flash content into a PDF document.
70.06 Create and modify automatically generated & manual bookmarks in a PDF document.
70.07 Add clickable links to a PDF document.
70.08 Incorporate Find and Search methods to locate specific text in a PDF document.
70.09 Describe the method used to search scanned documents (optical character recognition).
70.10 Understand and correct color separation issues.
70.11 Create and modify PDF documents using available tools to meet accessibility requirements (e.g., tags, reading order, forms, supplemental content for multimedia, text-to-speech).
70.12 Export a PDF document in a different format.

71.0 Display, distribution, and print considerations for PDF documents.

71.01 Define file specifications use to generate smaller files for electronic distribution and on-screen display.
71.02 Specify image downsampling and compression settings to generate a PDF file with a smaller file size.
71.03 Identify and correct potential printing issues in a PDF document.
71.04 Ensure a PDF document meets appropriate criteria for print or electronic distribution.
71.05 Demonstrate ability to control flattening of a transparent PDF document and misregistration.
71.06 Demonstrate color management techniques that affect on-screen display and printing.

71.07 Discuss methods and tools used to review a PDF document (email, shared, tracking).

72.0 Create and manage PDF forms.

72.01 Create an interactive from using fields, form objects, and distribution methods.
72.02 Distribute a form electronically and manage distributed forms.
72.03 Demonstrate ability to redact content in a form to protect sensitive information.
72.04 Preview, test, and modify an interactive form.

73.0 Incorporate PDF security in a PDF document.

73.01 Secure a PDF document using passwords, encryption, digital IDs and signatures.
73.02 Creating Security Policies and Certificates for a PDF document.
73.03 Enable usage rights for Adobe Readers.

74.0 Demonstrate proficiency using HTML5 features and functions.

74.01 Apply HTML5 APIs in web pages for interactivity (e.g., audio/video, drag & drop, drawing canvas).
74.02 Apply HTML5 interactivity elements into web pages (i.e., <canvas>, <embed>, <audio>, <video>, <details> <input>).
74.03 Utilize HTML5 fallback strategies to address browser support issues.
74.04 Utilize HTML5 to define dynamic behaviors using JavaScript.
74.05 Use HTML5 specification to manipulate text & images.
74.06 Use HTML5 to create persistent data and single session storage (HTML 5 Local Offline Storage & Session Storage).
74.07 Use HTML5 for media event handling (audio, video, embed, image).
74.08 Use HTML5 event handling for window, mouse, and form events.
74.09 Use CSS3 to style HTML5 (e.g., transitions, typography enhancements, etc).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Keyboarding and Business Skills**
Course Number: **8200320**
Course Credit: **.5**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental word processing applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society.

This course, along with Computer and Business Skills is equivalent to Computing for College and Careers. Students should complete this course before enrolling in Computer and Business Skills.

10.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 10.01 Develop keyboarding skills to enter and manipulate text and data.
- 10.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 10.03 Demonstrate basic file management skills.

11.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 11.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 11.02 Write clear and well-organized research papers, integrating a variety of information.
- 11.03 Prepare and deliver an oral report with appropriate materials to the class
- 11.04 Participate in large group discussions as a member and/or a leader.
- 11.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 11.06 Accurately follow written and oral instructions.
- 11.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

12.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 12.01 Select and use word processing software and accompanying features to enhance written business communications.
- 12.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.

12.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

13.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The student will be able to:

13.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
13.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
13.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

14.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

14.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
14.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

15.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

15.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
15.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
15.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

16.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

16.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
16.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.

16.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
16.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

17.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

17.01 Accept constructive criticism.
17.02 Apply appropriate strategies to manage and resolve conflict in work situations.
17.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

18.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
18.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computer and Business Skills**
Course Number: **8200330**
Course Credit: **.5**

Course Description:

This course is designed to introduce students to the basic skills and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

This course, along with Keyboarding and Business Skills is equivalent to Computing for College and Careers. Students should complete Keyboarding and Business Skills before enrolling in this course.

14.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 14.01 Develop keyboarding skills to enter and manipulate text and data.
- 14.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 14.03 Identify and describe communications and networking systems used in workplace environments.
- 14.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 14.05 Demonstrate basic file management skills.
- 14.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
- 14.07 Describe ethical issues and problems associated with computers and information systems.
- 14.08 Apply ergonomic principles applicable to the configuration of computer workstations.

15.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

- 15.01 Take notes, organize, summarize, and paraphrase ideas and details.
- 15.02 Accurately follow written and oral instructions.
- 15.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

16.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

16.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
16.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
16.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

17.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

17.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
17.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

18.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

18.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
18.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
18.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

19.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

19.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
19.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
19.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

20.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

20.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
20.02 Use personal assessment tools to identify personal strengths and weaknesses

related to learning and work environments.

20.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

21.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

21.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
21.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
21.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
21.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
21.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
21.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
21.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
21.08 Build mentor relationships with local professionals in the industry.

22.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

22.01 Accept constructive criticism.
22.02 Apply appropriate strategies to manage and resolve conflict in work situations.
22.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

23.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

23.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

24.0 Perform e-mail activities. – The student will be able to:

24.01 Describe e-mail capabilities and functions.
24.02 Use the Internet to perform e-mail activities.

25.0 Demonstrate operating systems. – The student will be able to:

25.01 Identify operating system file naming conventions.

25.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
25.03 Demonstrate a working knowledge of standard file formats.
25.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

26.0 Develop an awareness of emerging technologies. – The student will be able to:

26.01 Compare and contrast various methods of evaluation for emerging technologies.
26.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
26.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Computing for College and Careers**
Course Number: **8209020**
Course Credit: **1**

Course Description:

This course is designed to provide a basic overview of current business and information systems and trends and to introduce students to the basics and foundations required for today's business environments. Emphasis is placed on developing proficiency with touch keyboarding and fundamental computer applications, so that they may be used as communication tools for enhancing personal and work place proficiency in an information-based society. This also includes proficiency with computers using databases, spreadsheets, presentation applications, and the integration of these programs using software that meets industry standards.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance-The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Demonstrate basic computer file management skills.
- 01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.07 Describe ethical issues and problems associated with computers and information systems.
- 01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills-The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills-The student will be able to:

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles-The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace-The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance-The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance-The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals-The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals-The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up).
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace-The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance-The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities–The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems–The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies-The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Introduction to Information Technology**
Course Number: **8207310**
Course Credit: **1**

Course Description:

This course is designed to provide an introduction to information technology concepts and careers as well as the impact information technology has on the world, people, and industry and basic web design concepts. The content includes information technology career research; operating systems and software applications; electronic communications including e-mail and Internet services; basic HTML, DHTML, and XML web commands and design; and emerging technologies and webpage design.

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance — The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Identify and describe communications and networking systems used in workplace environments.
- 01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
- 01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
- 01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills — The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles — The student will be able to:

This standard supports the following Sunshine State Standards: [SSS #1, SSS#2, SSS #3, SSS #4, SSS #5, etc.]

04.01 Explore, design, implement, and evaluate organizational structures and cultures.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace — The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance — The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance — The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).

07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals — The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals — The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace — The student will be able to:

10.01 Accept constructive criticism.
10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences — The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.

12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.
12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the internet, intranet, and the www – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, pdf, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using html commands – The student will be able to:

15.01 Identify elements of a Webpage.
15.02 Describe individual Webpage layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Webpages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Webpages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.

15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance webpages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the www – The student will be able to:

16.01 Develop an awareness of acceptable Webpage design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Webpage design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to webpages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software - The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry - The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers - The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages - The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.

20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies - The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the open systems interface (osi) model - The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications - The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).
23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications - The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Foundations of Web Design**
Course Number: **9001110**
Course Credit: **1**

Course Description:

This course is designed to provide students with opportunities to acquire and apply foundational skills related to web design.

25.0 Demonstrate proficiency in website planning and the design process.

- 25.01 Define information architecture.
- 25.02 Discuss the importance of information architecture to web design and development.
- 25.03 Conduct a client interview to determine the business purpose and needs.
- 25.04 Conduct a competitive analysis.
- 25.05 Identify stages in the web design process and describe the activities comprising each stage.
- 25.06 Define the site structure by creating a content map, storyboard, and associated wireframes.
- 25.07 Create a global site map.
- 25.08 Discuss the legal and ethical issues related to web design.
- 25.09 Describe accessibility and its implications on web design.
- 25.10 Create a web site mock-up for client approval.

26.0 Develop markup language structures.

- 26.01 Define common markup languages and their usage.
- 26.02 Examine emerging and new markup languages.
- 26.03 Determine browser support and appropriate usage of markup languages (existing and emerging).
- 26.04 Identify common DOCTYPES (e.g., Strict, Transitional and Frameset) and describe their appropriate use.

27.0 Create basic webpages.

- 27.01 Create basic webpage structures using common markup elements and attributes.
- 27.02 Incorporate list structures in a webpage (i.e., ordered, unordered, definition, nested).
- 27.03 Incorporate link structures in a webpage (i.e., external, internal, email).
- 27.04 Research and incorporate web color usage principles in a webpage.
- 27.05 Troubleshoot markup language syntax, elements, and links.

28.0 Incorporate images and graphical formatting on a webpage.

- 28.01 Describe usage guidelines (e.g., format types, size, relevance) for integrating images and graphics onto a webpage.

28.02 Compare and contrast standard image formats used in webpage design.
28.03 Incorporate graphics into a webpage design.
28.04 Create and incorporate image maps in a webpage.
28.05 Optimize images and graphics for use in a webpage.

29.0 Create a basic table structure.

29.01 Describe how tables are used in web design.
29.02 Discuss the advantages and disadvantages of incorporating tables in a webpage design.
29.03 Define and modify table structures for the presentation of tabular information.
29.04 Create accessible tables using standard table elements and attributes.

30.0 Incorporate form structures in a webpage.

30.01 Create an accessible form using common elements, including form, fieldset, legend, textarea, select, option, button, and input (radio, checkbox, submit, reset, image, password, hidden).
30.02 Describe and diagram the relationship between XHTML forms and server-side technologies.
30.03 Compare and contrast the GET and POST methods for forms handling.
30.04 Define form validation and describe how it is accomplished
30.05 List popular server-side technologies often used to process content sent from XHTML forms.
30.06 Use labels with form elements.
30.07 Connect a XHTML form to a server-side script for processing.

31.0 Describe frame structures and their usage.

31.01 Explore frame and iframe structures and support issues.
31.02 Describe appropriate uses of iframes.
31.03 Incorporate frame structure in a webpage.

32.0 Use Cascading Style Sheets (CSS).

32.01 Define CSS and describe its importance in web design.
32.02 Compare and contrast existing and emerging CSS versions.
32.03 Determine browser support and appropriate usage of CSS (existing and emerging versions).
32.04 Explain "document flow" and describe its implications on web design.
32.05 Recognize and use element selectors, ID selectors, class selectors, pseudo-class selectors, and descendant selectors.
32.06 Explain how inheritance and specificity affect CSS rule conflicts.
32.07 Use inline styles, embedded style sheets, and external style sheets.
32.08 Use the link and import methods to connect to an external style sheet.
32.09 Use CSS shorthand techniques to create efficient and concise style sheets.
32.10 Apply basic CSS properties, including background, border, clear, color, float, font, height, line-height, list-style, margin, overflow, padding, position, text-align, text-indent, width, z-index, padding, et al.
32.11 Use CSS to style tables (e.g., borders, width, spacing, alignment, background).
32.12 Use CSS to enhance the appearance and usability of an XHTML form.

33.0 Examine web design technologies and techniques.

- 33.01 Compare and contrast common authoring tools.
- 33.02 Compare and contrast client-side and server-side technologies.
- 33.03 Define e-commerce types and usage.
- 33.04 Describe database connectivity relative to websites.
- 33.05 Identify technologies to enhance user experience.

34.0 Describe the process for publishing a website.

- 34.01 Explore domain name selection principles.
- 34.02 Identify process to registering a domain name.
- 34.03 Compare and contrast hosting providers, features, and selection criteria.
- 34.04 Describe the various means for uploading website files (e.g., FTP, web-based tools, etc.).

35.0 Describe how website performance is monitored and analyzed.

- 35.01 Identify issues related to website maintenance.
- 35.02 Use webpage validation tools.
- 35.03 Describe website performance metrics (e.g., visits, time-on-page, time-on-site, et al) and discuss their design implications.
- 35.04 Demonstrate knowledge of accessibility problems and solutions.
- 35.05 Examine indexing, page ranking, basic Search Engine Optimization techniques.
- 35.06 Explore common website analytic tools.

36.0 Create an informational website.

- 36.01 Use GUI (Graphical User Interface) web authoring software to create a multi-page informational website.
- 36.02 Use image-editing software to enhance website designs with simple graphics.
- 36.03 Use animation software to enhance website designs.
- 36.04 Enhance the website using client-side technologies (rollovers, check plug-ins, pop-up windows).
- 36.05 Demonstrate efficient, consistent web site development practice (use of templates, snippets, etc).

74.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

- 74.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
- 74.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
- 74.03 Present information formally and informally for specific purposes and audiences. AF2.9

75.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

- 75.01 Demonstrate knowledge of arithmetic operations. AF3.2
- 75.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
- 75.03 Construct charts/tables/graphs using functions and data. AF3.5

76.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

76.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1

76.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **User Interface Design**
Course Number: **9001120**
Course Credit: **1**

Course Description:

This course provides advanced concepts used in interface design. The content includes principles of Human Computer Interface (HCI), advanced page design using Cascading Style Sheets (CSS), advanced HTML commands, multimedia applications, Internet/Intranet tools, and website promotion.

37.0 Incorporate Human Computer Interface (HCI) principles of design.

- 37.01 Describe the fundamental design principles of human computer interface.
- 37.02 Differentiate between computer and human factors in screen/page design.
- 37.03 Describe what is meant by an "intuitive" interface.
- 37.04 Describe how typography, color scheme, and graphic usage are used to set website feel/tone for various types of websites (e.g., educational, entertainment, ecommerce).Identify and use the following design concepts: contrast, repetition, alignment, proximity, writing style.
- 37.05 Identify and use the following design concepts: contrast, repetition, alignment, proximity, writing style.
- 37.06 Define and establish logo, identity, and branding needed for an effective website.
- 37.07 Evaluate the HCI features included on a webpage storyboard.
- 37.08 Create a series of webpage storyboards that incorporate HCI design principles.

38.0 Research and obtain information for use in designing the user interface.

- 38.01 Identify common user information needs, information gathering models, and methods for gathering user research.
- 38.02 Define the primary audience and customer expectations and develop a rubric for defining user tasks and corresponding functionality.
- 38.03 Describe target audience preferences based on demographics (e.g., gender, age, economic status, culture, et al).
- 38.04 Identify and use web analytic tools to shape an information architecture strategy (determine keywords, etc.).
- 38.05 Apply the results of research and analytics to the design of a user interface.

39.0 Create an intuitive interface using Cascading Style Sheets (CSS).

- 39.01 Create CSS styles suitable for use on an intuitive webpage interface.
- 39.02 Use element selectors, ID selectors, class selectors, pseudo-class selectors, and descendant selectors to create a table-less webpage design
- 39.03 Create a series of templates formatted exclusively using CSS.
- 39.04 Use CSS syntax to configure and apply style sheets for multiple media displays (e.g., screen display and print).

39.05 Create webpage templates using advanced CSS methods (e.g., create multi-column layouts, mimic client-side technologies, create faux columns, etc.).
39.06 Differentiate among static, relative, absolute, and fixed positioning schemas.
39.07 Use schemas to design a website: fixed, liquid, elastic designs.
39.08 Recognize browser support for static, relative, absolute, and fixed positioning schemas.
39.09 Identify and correct display issues in a web page using multiple browsers.

40.0 Demonstrate proficiency creating a logical website file structure.

40.01 Create an efficient, maintainable directory structure for a website, including the site root and subfolders for assets (e.g., images, templates, CSS, et al.).
40.02 Demonstrate and use correct file paths for relative, site root relative, and absolute links.

41.0 Create a CSS formatted informational website.

41.01 Use GUI (Graphical User Interface) web authoring software to create a multi-page informational website.
41.02 Create documented CSS style sheets for layout and appearance purposes.
41.03 Incorporate methods used to drive traffic to the website, then engage and retain visitors.
41.04 Apply standard optimization practices (e.g., keyword proximity; density; relevance; appropriate page titles, URLs, and headings, alt tags; et al) to enhance search engine performance.
41.05 Use standard design techniques to correctly display a website using multiple browsers (e.g., box model, hasLayout, Internet Explorer Conditional Comments (IECC)).
41.06 Integrate common multimedia and plug-ins as appropriate to enhance a website design.
41.07 Use client-side technologies such as rollovers, check plug-ins, and pop-up windows to enhance the user interface.

42.0 Demonstrate proficiency publishing, testing, monitoring, and maintaining a website.

42.01 Recognize the relationship between local and remote site structure.
42.02 Identify methods of acquiring a domain name, appropriate hosting, and search engine registry.
42.03 Understand and implement strategies to measure website traffic and improve search engine analytics reports.
42.04 Describe the use of standard web marketing technologies (e.g., blogging, podcasting, et al).
42.05 Describe how social media and social networking sites can be used for marketing purposes.
42.06 Test websites using common resolutions, browsers, accessibility, and validation techniques.
42.07 Use popular Internet browsers and tools as defined by W3C Browser Statistics (e.g., Mozilla Firefox (Web Developer Toolbar, ColorZilla, MeasureIt, Firebug), Internet Explorer 7/8) to display and troubleshoot websites.
42.08 Explore standard practices for feedback and usability testing
42.09 Identify and incorporate standard security measures in a website.

42.10 Identify and use online validation tools.
42.11 Successfully change invalid markup to comply with standards.
42.12 Build a webpage that successfully passes the W3C validation test at http://validator.w3.org.
42.13 Write markup that facilitates accessibility.
42.14 Use FTP to transfer files to a server.
42.15 Set up an FTP connection to a remote site and reproduce the site structure on the server.

77.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

77.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
77.02 Locate, organize and reference written information from various sources. CM 3.0
77.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
77.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
77.05 Apply active listening skills to obtain and clarify information. CM 7.0
77.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
77.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

78.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

78.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
78.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
78.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
78.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

79.0 Use information technology tools. – The student will be able to:

79.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
79.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
79.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
79.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

80.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

80.01 Describe the nature and types of business organizations. SY 1.0
80.02 Explain the effect of key organizational systems on performance and quality.
80.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0

80.04 Explain the impact of the global economy on business organizations.

83.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

83.01	Evaluate and justify decisions based on ethical reasoning.	ELR 1.0
83.02	Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies.	ELR1.1
83.03	Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace.	ELR1.2
83.04	Interpret and explain written organizational policies and procedures.	ELR 2.0

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Web Scripting Fundamentals**
Course Number: **9001130**
Course Credit: **1**

Course Description:

This course provides an introduction to scripting related to web development. The content primarily focuses on client-side scripting using JavaScript.

43.0 Discuss the differences between server-side and client-side scripting.

- 43.01 Describe the role scripting languages play in the creation of websites.
- 43.02 Identify and describe the advantages, disadvantages, and primary uses of popular scripting languages (e.g., JavaScript, VBScript, Perl, PHP, JScript, et al).

44.0 Compare and contrast client-side scripting languages (JavaScript, VBScript, and ECMAScript).

- 44.01 Describe the primary usage and limitations of JavaScript in a web environment.
- 44.02 Describe how JavaScript blends with other web-authoring technologies (i.e., HTML, CSS, Server-side programming, Plug-ins, etc.).
- 44.03 Describe the primary differences between JavaScript and VBScript.
- 44.04 Describe the source, features, and common uses of ECMAScript.
- 44.05 Explain why JavaScript use far exceeds VBScript for client-side scripting.
- 44.06 Research resources available to advance JavaScript knowledge.
- 44.07 Explore emerging trends and upcoming revisions related to JavaScript.

45.0 Demonstrate understanding of the Document Object Model (DOM).

- 45.01 Describe the purpose of the Document Object Model (layout, objects, properties, and methods).
- 45.02 Describe how JavaScript uses the DOM to detect and manipulate elements on a webpage.

46.0 Design, write, debug, and incorporate a JavaScript client-side script into a webpage.

- 46.01 Write, analyze and explain JavaScript syntax.
- 46.02 Describe usage of various data types.
- 46.03 Describe how the use of decision-making logic (AND, OR) is employed in a JavaScript program.
- 46.04 Create and use variables, operators, and expressions.
- 46.05 Use common JavaScript events and event handlers (e.g., click, load, onClick, onLoad) to control program flow, appearance, or functionality.
- 46.06 Understand and incorporate JavaScript arrays (e.g., array basics, types, usage, methods, sorting).
- 46.07 Understand and incorporate JavaScript functions (e.g., using the DOM, pass a value, return value, create objects, work with classes and objects).

46.08 Understand and incorporate JavaScript loops and conditions (e.g., loop basics, types, usage).
46.09 Recognize, isolate, and correct common JavaScript errors (e.g., syntax, function errors, reserved word usage, unsupported DOM).
46.10 Identify limitations related to obsolete JavaScript constructs and coding practices (e.g., Document.all, navigator.appName).
46.11 Apply JavaScript best coding practices (i.e., properly documenting scripts, field naming conventions, writing understandable code).
46.12 Use different methods to incorporate JavaScript onto a web page (e.g., <script> element, JavaScript statement block, external scripts).
46.13 Troubleshoot and test incorporated script (i.e., functionality, browser usage, resolve known bugs).

47.0 Incorporate basic JavaScript form validation and form handling (using pre-built validation scripts or online libraries).

47.01 Identify and use form elements to solicit user input.
47.02 Use JavaScript with HTML form controls.
47.03 Validate web forms prior to submission.
47.04 Use output commands to display processed data in an appropriately formatted form.

48.0 Use advanced JavaScript techniques.

48.01 Write JavaScript suitable for plug-in detection, image manipulation, and the creation of custom JavaScript objects.
48.02 Use JavaScript to incorporate, create, update, and delete cookies.
48.03 Describe the common security issues relevant to JavaScript.

49.0 Demonstrate understanding of JavaScript accessibility issues.

49.01 Describe the purpose of the Browser Object Model (BOM) and how it relates to JavaScript.
49.02 Describe how obsolete constructs and coding practices affect browser function.
49.03 Make webpages accessible and functional when JavaScript disabled or unsupported.
49.04 Demonstrate ability to use XHTML, HTML, and CSS instead of JavaScript where appropriate.
49.05 Demonstrate ability to determine which version of JavaScript specific browsers support and code program to meet acceptable standards.

50.0 Select and modify appropriate library and pre-built JavaScript to incorporate into webpage.

50.01 Explore common JavaScript libraries and describe the advantages & disadvantages of using libraries.
50.02 Analyze pre-built library items to determine functionality.
50.03 Explain how a library item achieves desired processing.
50.04 Determine if pre-built script provides functionality required in an effective manner.
50.05 Incorporate pre-built library items into web pages.

50.06 Identify the restrictions related to using pre-built scripts (i.e.; copyright, processing, and length of script).
50.07 Modify pre-built scripts to suit functionality requirements.
50.08 Test and troubleshoot pre-built scripts and widgets incorporated into web pages.

81.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

81.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
81.02 Explain emergency procedures to follow in response to workplace accidents.
81.03 Create a disaster and/or emergency response plan. SHE 2.0

82.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

82.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
82.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
82.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
82.04 Employ mentoring skills to inspire and teach others. LT 5.0

84.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

84.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
84.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
84.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
84.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
84.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
84.06 Identify and exhibit traits for retaining employment. ECD 7.0
84.07 Identify opportunities and research requirements for career advancement. ECD 8.0
84.08 Research the benefits of ongoing professional development. ECD 9.0
84.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

85.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

85.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
85.02 Describe the effect of money management on personal and career goals. FL 3.0
85.03 Develop a personal budget and financial goals. FL3.1
85.04 Complete financial instruments for making deposits and withdrawals. FL3.2
85.05 Maintain financial records. FL3.3
85.06 Read and reconcile financial statements. FL3.4
85.07 Research, compare and contrast investment opportunities.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Media Integration Essentials**
Course Number: **9001140**
Course Credit: **1**

Course Description:

This course provides in-depth instruction into techniques for integrating various forms of media onto webpages, with particular focus on XML and AJAX technologies and frameworks. Students should have a good understanding of JavaScript prior to taking this course.

51.0 Incorporate graphics, animations, and video assets into a webpage design using conventional HTML techniques.

- 51.01 Use the HREF tag to integrate a video file displayed in a new window.
- 51.02 Use the EMBED tag to display a graphic animation or a video file as part of the webpage fabric.
- 51.03 Discuss the limitations of conventional media integration techniques.

52.0 Demonstrate understanding of XML vocabularies and documents.

- 52.01 Understand XML vocabularies.
- 52.02 Define well-formed and valid XML documents.
- 52.03 Describe the basic structure of an XML document.

53.0 Create and debug an XML Document.

- 53.01 Create an XML declaration.
- 53.02 Work with XML comments.
- 53.03 Create XML elements and attributes.
- 53.04 Work with character and entity references.
- 53.05 Describe how XML handles character data, parsed character data, and white space.
- 53.06 Work with XML parsers.
- 53.07 Understand how Web browsers work with XML documents.
- 53.08 Apply a style sheet to an XML document.
- 53.09 Create an XML processing instruction.

54.0 Create and debug compound documents with Namespaces.

- 54.01 Understand compound documents and the problem of name collision.
- 54.02 Declare a namespace for an XML vocabulary.
- 54.03 Apply a namespace to an element.
- 54.04 Create a default namespace.
- 54.05 Apply a namespace to an attribute.
- 54.06 Declare a namespace within a CSS style sheet.
- 54.07 Apply a namespace to a style selector.
- 54.08 Use the escape character to apply a namespace to a selector.

54.09 Create a compound document containing XML and XHTML elements and attributes.

55.0 Demonstrate ability to validate documents with a Data Type Definition (DTD).

55.01 Understand the principles of data validation.
55.02 Create a DOCTYPE.
55.03 Specify the content of an XML element.
55.04 Define the structure of child elements.
55.05 Describe how DOCTYPE changed from HTML4.01 to HTML5.

56.0 Demonstrate ability to validate documents with XML Schema.

56.01 Compare schemas and DTDs.
56.02 Explore different schema vocabularies.
56.03 Declare simple type elements and attributes.
56.04 Declare complex type elements.
56.05 Apply a schema to an instance document.
56.06 Work with XML Schema data types.
56.07 Derive new data types for text strings, numeric values, and dates.
56.08 Create data types for patterned data using regular expressions.
56.09 Explore different schema structures.
56.10 Attach a schema to a namespace.
56.11 Validate compound instance documents.
56.12 Import one schema file into another.

57.0 Demonstrate an understanding of Asynchronous JavaScript And XML (AJAX) and its implications for web developers.

57.01 Identify the technologies that comprise AJAX and explain how they interact.
57.02 Describe the purpose, advantages, disadvantages, and functions of AJAX.
57.03 Describe how AJAX works and how it is used in the creation of websites.
57.04 Identify AJAX requirements.
57.05 Install and setup the AJAX Control Toolkit.
57.06 Define appropriate use of AJAX in a web project.
57.07 Identify AJAX Usability and Accessibility issues and their workarounds.
57.08 Describe AJAX related browser compatibility issues and their workarounds.
57.09 Explore popular AJAX applications currently on the Internet (auto-complete (Google), updating user content (Twitter), voting and rating (social bookmarking))
57.10 Describe common security issues associated to AJAX
57.11 Analyze the server-side implications of AJAX applications
57.12 Explore methods for testing and maintaining an AJAX application.
57.13 Explore the future of AJAX and its implementation.

58.0 Plan and implement a multi-page website that features graphics, pictures, and video galleries using AJAX techniques.

58.01 Research AJAX design principles and patterns (e.g., Observer, Command and MVC).
58.02 Research and compare popular AJAX frameworks, libraries, and toolkits (e.g., JQuery, DOJO, Prototype, et al).

58.03 Identify and implement methods of using AJAX when JavaScript not available (e.g. progressive enhancement).
58.04 Update specific areas of a page with data from the server (e.g., server-login updated) without reloading the webpage.
58.05 Demonstrate the ability to output results in different formats (e.g., XML, JSON, alternatives to JavaScript).
58.06 Use AJAX to create form submission & validation (e.g. password strength check, email/URL validation).
58.07 Integrate a basic slideshow via lightbox using AJAX techniques.
58.08 Integrate optional video selections displayed using AJAX techniques.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **E-commerce & Marketing Essentials**
Course Number: **9001150**
Course Credit: **1**

Course Description:

This course provides instruction in the design, creation, marketing, and monitoring of e-commerce websites. Content also includes the associated security issues and methods.

59.0 Demonstrate knowledge and skills necessary to setup a secure E-commerce site.

- 59.01 Compare and contrast popular pre-built shopping cart software (e.g., PrestaShop, Zend Cart).
- 59.02 Compare and contrast hosting options available for use with shopping cart software (i.e., shared hosting or dedicated server).
- 59.03 Discuss shopping cart vulnerabilities and best-practice preventative measures.
- 59.04 Identify hardware and software necessary to install and setup pre-built shopping cart software.
- 59.05 Install and configure necessary software (database, server, etc.) to run pre-built shopping cart software.
- 59.06 Install and configure pre-built shopping cart software.
- 59.07 Verify database and server connectivity.
- 59.08 Test and troubleshoot setup/configuration issues.

60.0 Identify security issues associated with e-commerce and discuss methods to mitigate risks.

- 60.01 Describe the differences between Transaction Layer Security (TLS) and its predecessor, Secure Sockets Layer (SSL).
- 60.02 Explain transaction security.
- 60.03 Identify security and payment processing issues involved in developing a site (e.g., SSL, Digital Certificates, SET Protocol, Cyber Cash).
- 60.04 Demonstrate understanding of https and htaccess and their usage.
- 60.05 Explore methods to obtain an SSL certificate and secure transactions.
- 60.06 Compare and contrast the appropriateness of employing a merchant account or a payment gateway to handle online transactions.
- 60.07 Discuss the process, advantages, disadvantages, and costs associated with opening a merchant account.
- 60.08 Describe the process, advantages, disadvantages, and costs associated with using a payment gateway.

61.0 Apply skills necessary to setup an E-commerce storefront.

- 61.01 Setup and use an FTP (File Transfer Protocol) program to transfer files to a web server.
- 61.02 Add business specific information to site storefront (e.g., logos, product images, descriptions, et al).

61.03 Setup back-end site administration functions and navigation.
61.04 Setup a schema for incorporating shipping, handling, and processing fees based on carrier, geographical zones, and weight/price range.
61.05 Experiment with various add-ons, themes, and modules available for customization.
61.06 Customize shopping cart to suit client needs (e.g., modify fields, add buttons, etc.).
61.07 Customize forms to accommodate client products and/or services.
61.08 Setup Search preferences and functionality for products and/or services.
61.09 Setup customer contact preferences and email notification functionality.
61.10 Apply Search Engine Optimization (SEO) techniques to shopping cart pages.
61.11 Test operation of shopping cart pages in multiple browsers.
61.12 Troubleshoot issues and errors related to browser display and functionality.

62.0 Employ techniques to enhance the value and profitability of an E-commerce website.

62.01 Determine business goals for the e-commerce site.
62.02 Identify the various types of advertising options in e-commerce (e.g., links, banner ads, affiliate programs, pop-up windows, viral marketing, newsgroup postings, et al).
62.03 Describe affiliate marketing and its implications for e-commerce websites.
62.04 Analyze popular affiliate programs/networks and available payment schemes.
62.05 Explain the differences, advantages, and disadvantages of CPM, PPC, and Pay per Sale/Lead.
62.06 Determine appropriate affiliate program for target audience.
62.07 Identify the method to join an affiliate program/network.
62.08 Identify considerations/ requirements of selecting an affiliate program.
62.09 Determine appropriate number of affiliate programs necessary to suit client site.
62.10 Determine the terms and conditions of sale, including warranties, after-sales service, and privacy assurances.
62.11 Determine customer service options (e.g., e-mail, phone, fax).
62.12 Create a site map.
62.13 Create a Frequently Asked Questions (FAQ) page.
62.14 Create a product/version comparison chart, where appropriate.
62.15 Create feedback, review, survey, and recommendation pages.

63.0 Develop evaluation and performance monitoring metrics and target goals for an E-commerce website.

63.01 Research existing and emerging analytical, usability, SEO tools to improve customer satisfaction and site conversion rates.
63.02 Describe web analytics tools and their features/functions.
63.03 Use web analytics tools to determine optimum site keywords.
63.04 Experiment with using advanced segments to view subsets of data (relating to purchasing habits, website usage, searches).
63.05 Customize analytic reports using appropriate metrics (e.g., average per-visit value, bounce rates, time spent on page, et al).
63.06 Create more concise reports using advanced filters in web analytics tools.
63.07 Use intelligence features of web analytics tools to discover patterns of usage and setup corresponding alerts.
63.08 Research popular mobile analytics tools (e.g., Motally, et al) and their features.

63.09 Interpret analytic report data and optimize website accordingly, if appropriate.

2011 – 2012

Florida Department of Education
Student Performance Standards

Course Title: **Interactivity Essentials**
Course Number: **9001160**
Course Credit: **1**

Course Description:

This course provides instruction on technologies and techniques for enhancing the interactivity of websites from both site visitor and administration perspectives. Also covered are methods for PDF forms handling and content management.

64.0 Demonstrate an understanding of Content Management Systems (CMS) and their implications for web development.

- 64.01 Describe the fundamental operation of a CMS.
- 64.02 Describe the typical features of a content management system.
- 64.03 Compare and contrast popular CMS applications (e.g., WordPress, Joomla, et al).
- 64.04 Describe how a content management system can be used to enhance website interactivity.
- 64.05 Demonstrate proficiency installing and configuring content management systems and extensions/modules.

65.0 Use CMS features, functions, and extensions/modules to create/enhance a website.

- 65.01 Create a basic multipage website using a content management system.
- 65.02 Enhance a webpage by using a content management system to incorporate images, animations, or video segments.
- 65.03 Incorporate a blog feature into a website using a content management system.
- 65.04 Demonstrate proficiency using CMS built-in security for website, password and database backup.
- 65.05 Demonstrate proficiency using add-on modules, or plug-ins.

66.0 Evaluate the suitability for and system requirements for a content management system.

- 66.01 Identify business goals and evaluate their suitability for a content management system.
- 66.02 Determine web hosting system requirements.
- 66.03 Create a schema for creating, deleting, and managing users and their permissions.
- 66.04 Discuss the value represented by templates in a content management system development environment.

67.0 Demonstrate an understanding of multimedia applications and their implications for web designers.

- 67.01 Compare and contrast the leading multimedia development applications for website development (e.g., Adobe Flash, Microsoft Silverlight, et al).

67.02 Describe those circumstances whereby multimedia may be used to add interactivity to a website.
67.03 Describe the limitations of multimedia development applications relative to website development.

68.0 Create and incorporate interactive website components.

68.01 Create buttons, menus, and other components that feature a static, hover, and rollover effect.
68.02 Convert original artwork into an interactive component with associated script behavior.
68.03 Adjust the component properties including opacity, filter, rotation, and action.
68.04 Resize a multi-layer component to ensure uniform resizing of each layer.
68.05 Create scrolling images, panels, and lists for incorporating into a web design.
68.06 Create and incorporate animated banners, headers, and website introduction pages (e.g., Adobe Flash, Microsoft Silverlight).

69.0 PDF document usage considerations.

69.01 Discuss the advantages and disadvantages of using PDF documents in a web site.
69.02 Research and discuss PDF document usage best practices.
69.03 Determine when it is appropriate to use PDF documents (e.g., brochure downloads, large reports, catalogs, interactive forms).
69.04 Compare and contrast the functionality of software applications used to create and process PDFs.
69.05 Research and describe search engine optimization considerations related to the use of PDF documents.
69.06 Research and discuss security issues related to PDF document usage in a web site (viruses, auto-open).
69.07 Identify accessibility issues related to using PDF documents in a web site.

70.0 Create, format, and manipulate PDF documents.

70.01 List and describe the methods available for creating PDF documents.
70.02 Create a PDF using a variety of software applications, multiple files, and web pages.
70.03 Demonstrate ability to format, modify and enhance a PDF document.
70.04 Describe the differences in PDF standards for document prepress data interchange and long-term archiving.
70.05 Embed images, text, audio, video, and Flash content into a PDF document.
70.06 Create and modify automatically generated & manual bookmarks in a PDF document.
70.07 Add clickable links to a PDF document.
70.08 Incorporate Find and Search methods to locate specific text in a PDF document.
70.09 Describe the method used to search scanned documents (optical character recognition).

70.10 Understand and correct color separation issues.
70.11 Create and modify PDF documents using available tools to meet accessibility requirements (e.g., tags, reading order, forms, supplemental content for multimedia, text-to-speech).
70.12 Export a PDF document in a different format.

71.0 Display, distribution, and print considerations for PDF documents.

71.01 Define file specifications use to generate smaller files for electronic distribution and on-screen display.
71.02 Specify image downsampling and compression settings to generate a PDF file with a smaller file size.
71.03 Identify and correct potential printing issues in a PDF document.
71.04 Ensure a PDF document meets appropriate criteria for print or electronic distribution.
71.05 Demonstrate ability to control flattening of a transparent PDF document and misregistration.
71.06 Demonstrate color management techniques that affect on-screen display and printing.
71.07 Discuss methods and tools used to review a PDF document (email, shared, tracking).

72.0 Create and manage PDF forms.

72.01 Create an interactive from using fields, form objects, and distribution methods.
72.02 Distribute a form electronically and manage distributed forms.
72.03 Demonstrate ability to redact content in a form to protect sensitive information.
72.04 Preview, test, and modify an interactive form.

73.0 Incorporate PDF security in a PDF document.

73.01 Secure a PDF document using passwords, encryption, digital IDs and signatures.
73.02 Creating Security Policies and Certificates for a PDF document.
73.03 Enable usage rights for Adobe Readers.

74.0 Demonstrate proficiency using HTML5 features and functions.

74.01 Apply HTML5 APIs in web pages for interactivity (e.g., audio/video, drag & drop, drawing canvas).
74.02 Apply HTML5 interactivity elements into web pages (i.e., <canvas>, <embed>, <audio>, <video>, <details> <input>).
74.03 Utilize HTML5 fallback strategies to address browser support issues.
74.04 Utilize HTML5 to define dynamic behaviors using JavaScript.
74.05 Use HTML5 specification to manipulate text & images.
74.06 Use HTML5 to create persistent data and single session storage (HTML 5 Local Offline Storage & Session Storage).
74.07 Use HTML5 for media event handling (audio, video, embed, image).
74.08 Use HTML5 event handling for window, mouse, and form events.
74.09 Use CSS3 to style HTML5 (e.g., transitions, typography enhancements, etc).

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Web Programming Services**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

PSAV	
Program Number	B079200
CIP Number	0507.039907
Grade Level	30, 31
Standard Length	1200 hours
Teacher Certification	BUS ED 1 @2 VOE @7 TEACH CBE @7 BUS DP @7 G ELECT DP @7 G TEC ELEC $7 G COMPU SCI 6
CTSO	Phi Beta Lambda BPA
SOC Codes (all applicable)	15-1099.04
Facility Code	[212] http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp
Basic Skills Level	Mathematics: 11.0 Language: 11.0 Reading: 11.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers such as a Web Developer Assistant, Database Specialist, Junior Application Developer, and Web Application Developer in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and

occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to foundation in the area of designing and developing interactive, database-driven Web-based applications using an enterprise level Relational Database Management System (RDBMS) software such as Oracle, Microsoft SQL Server, or MySQL and a Web/database connectivity middleware technology such as PHP, ColdFusion, ASP.NET, or Java.

Program Structure

This program is a planned sequence of instruction consisting of four occupational completion points.

When offered at the post secondary adult career and technical level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44(3)(b), F.S.

The following table illustrates the program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	CTS0011	Web Developer Assistant	200	15-1099.04
B	CTS0012	Database Specialist	200	15-1099.04
C	CTS0013	Junior Application Developer	400	15-1099.04
D	CTS0014	Web Application Developer	400	15-1099.04

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Program Implementation

This program framework is designed to accommodate the use of software from various vendors. It is expected that the instructor will select and focus instruction on a single vendor's RDBMS software together with a single middleware computer language (e.g. Oracle/Java, MS SQL Server/ASP.NET, MySQL/PHP or other combination).

In some cases it may be beneficial to teach OCP C and OCP D concurrently when the language chosen does not have core components traditionally taught separately from Web components (e.g. ColdFusion and PHP).

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and Business Professionals of America (BPA) are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C. the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 11.0, Language 11.0, and Reading 11.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

This program (B079200) has a two statewide articulation agreement approved by the Articulation Coordinating Committee:

1. Computer Programming and Analysis AS/AAS (0507030500/1507030500) – 12 credits
2. Internet Services Technology AS/AAS (0507039902/1507039902) – 9 credits

For details on articulation agreements which correlate to programs and industry certifications refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Demonstrate proficiency navigating the Internet, the WWW and other TCP/IP-based networks.
02.0 Demonstrate proficiency using HTML and XHTML to create Web content.
03.0 Demonstrate proficiency using Cascading Style Sheets (CSS) to format Web pages.

04.0 Demonstrate proficiency using basic client-side scripting to control the content and the behavior of HTML and XHTML documents.
05.0 Develop an awareness of the general definition, history and main features of the Relational Database Model.
06.0 Compare the Relational Database Model with the Hierarchical Database Model.
07.0 Develop an awareness of the most popular RDBMS software products currently available and the main features of each product.
08.0 Develop skills related to the process of determining an organization's current and future data storage needs as they relate to the organization of a database.
09.0 Develop an understanding of database terminology related to conceptual database models and physical databases.
10.0 Design Entity Relationship Models (ERMS) that accurately reflect the information needs of an organization.
11.0 Verify the ERM design by applying the rules of normalization (e. g. first, second and third normal form).
12.0 Create relational database tables based on ERMS using RDBMS software.
13.0 Test relational database designs by adding sample data to the database tables, verifying that data integrity is maintained and business rules are enforced.
14.0 Demonstrate proficiency writing and executing SQL (Structured Query Language) SELECT statements to retrieve data using a SQL language interface and reporting tool.
15.0 Demonstrate proficiency manipulating data by using Data Manipulation Language (DML) statements and transaction control statements.
16.0 Demonstrate proficiency creating, altering and deleting database objects using SQL Data Definition Language (DDL) statements (e. g. tables, constraints, views synonyms, indexes, sequences).
17.0 Demonstrate an understanding of basic database security concepts.
18.0 Demonstrate the ability to develop data-centric programs to manipulate data using a language that extends SQL (such as PL/SQL).
19.0 Demonstrate the ability to create, execute and maintain database program units including stored procedures and database triggers.
20.0 Demonstrate an understanding of basic concepts related to the development of software.
21.0 Demonstrate an understanding of the key features of a Web/database connectivity middleware computer programming language.
22.0 Write, compile (if applicable), and execute simple programs utilizing fundamental programming constructs.
23.0 Write programs that utilize arrays and other data structures (e.g., vectors, lists, structures, etc.).
24.0 Design and develop programs structured on an Object Oriented model.
25.0 Incorporate error handling in programs.
26.0 Write programs that write data to files and read data from files.
27.0 Demonstrate a basic understanding of the role of web/database connectivity middleware in the development of dynamic web content.
28.0 Develop basic web applications.
29.0 Develop database-driven web applications.
30.0 Develop web applications that incorporate session tracking.
31.0 Implement web application security techniques.
32.0 Demonstrate the use of an architectural model to design web applications.
33.0 Demonstrate the ability to create and consume XML-based web services.
34.0 Demonstrate language arts knowledge and skills.
35.0 Demonstrate mathematics knowledge and skills.

36.0 Demonstrate science knowledge and skills.
37.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
38.0 Solve problems using critical thinking skills, creativity and innovation.
39.0 Use information technology tools.
40.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
41.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
42.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
43.0 Describe the importance of professional ethics and legal responsibilities.
44.0 Explain the importance of employability skill and entrepreneurship skills.
45.0 Demonstrate personal money-management concepts, procedures, and strategies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Web Programming Services**
PSAV Number: **B079200**

Course Number: CTS0011
Occupational Completion Point – A
Web Developer Assistant – 200 Hours – SOC Code 15-1099.04

01.0 Demonstrate proficiency navigating the internet, the www, and other TCP/IP-based networks. - The student will be able to:

- 01.01 Identify and describe Web terminology.
- 01.02 Describe the history of the Internet.
- 01.03 Describe the difference between a client and a server.
- 01.04 Describe the difference between the Internet, the WWW, and private intranets.
- 01.05 Describe the different methods by which information may be accessed on the Internet or on an intranet (e.g., HTTP, FTP).
- 01.06 Locate information on the Internet using a Web browser.
- 01.07 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
- 01.08 Identify and use Internet search engines and directories to locate information.
- 01.09 Describe the syntax, usage, and construction of Uniform Resource Locaters (URLs).
- 01.10 Demonstrative proficiency in using an FTP client to transfer and manage files and directories.

02.0 Demonstrate proficiency using HTML and XHTML to create web content — The student will be able to:

- 02.01 Use storyboarding techniques for designing a Web site (e.g., linear, hierarchical).
- 02.02 Identify elements of a Web page.
- 02.03 Create Web pages using HTML and XHTML tags that create basic elements (e.g., links, lists, formatted text, tables).
- 02.04 Create Web pages that utilize tables to achieve complex layout.
- 02.05 Add graphic content to Web pages.
- 02.06 Develop, integrate, and apply the use of frames in Web site design.
- 02.07 Create Web pages that utilize client-side image maps.
- 02.08 Develop, integrate, and apply the use of forms in Web site design.
- 02.09 Optimize Web content for desirable search engine placement.
- 02.10 Demonstrate an understanding of browser compatibility issues by designing pages that comply with the current Web Content Accessibility Guidelines issued by the World Wide Web Consortium (W3C).
- 02.11 Demonstrate an understanding of Web accessibility issues by developing pages that meet Bobby standards.
- 02.12 Explain basic XML syntax and how XHTML conforms to the XML standard.
- 02.13 Use a WYSIWYG editor to develop and manage a Web site.

02.14 Use markup validation tools to test HTML and XHTML documents for well-formedness and make all corrections necessary to ensure compliance with W3C standards.
02.15 Analyze and modify HTML and XHTML source code developed by others.

03.0 Demonstrate proficiency using cascading style sheets (CSS) to format web pages. – The student will be able to:

03.01 Explain the advantages and disadvantages of using Cascading Style Sheets (CSS) to format Web pages.
03.02 Describe the difference between linked, embedded, imported and inline styles and explain how styles are inherited.
03.03 Utilize CSS properties within Web pages to control page layout, fonts, colors, backgrounds, and other presentation effects.

04.0 Demonstrate proficiency using basic client-side scripting to control the content and the behavior of HTML and XHTML documents. – The student will be able to:
04.01 Describe the difference between server-side and client-side processing.
04.02 Describe the term "scripting language" and explain how scripting languages differ from compiled languages.
04.03 Code a simple script within a Web page.
04.04 Declare, assign values to, and utilize variables within a script.
04.05 Code and utilize functions of various types including ones that use parameters and return values.
04.06 Utilize mathematical, assignment, comparison and logical operators within script code.
04.07 Utilize conditional statements and looping structures within script code.
04.08 Define and access arrays and array elements within a script.
04.09 Code scripts that make use of event handlers.
04.10 Code scripts that perform validation on HTML/XHTML form elements.

34.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

34.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
34.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
34.03 Present information formally and informally for specific purposes and audiences. AF2.9

35.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

35.01 Demonstrate knowledge of arithmetic operations. AF3.2
35.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
35.03 Construct charts/tables/graphs using functions and data. AF3.5

36.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

36.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1

36.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

Course Number: CTS0012
Occupational Completion Point – B
Database Specialist – 200 Hours – SOC Code 15-1099.04

05.0 Develop an awareness of the general definition, history and main features of the relational database model. - The student will be able to:

05.01 Briefly discuss the history of the development of the Relational Database Model.
05.02 Identify the advantages of the Relational Database Model related to data integrity, data independence from application code, and ease of data retrieval.

06.0 Compare the relational database model with the hierarchical database model. — The student will be able to:

06.01 Discuss the basic concepts of the Hierarchical Database Model.
06.02 Identify the limitations of the Hierarchical Database Model, including problems related to data redundancy and interdependence with application code.

07.0 Develop an awareness of the most popular RDBMS software products currently available and the main features of each product. — The student will be able to:

07.01 List several shared-file database products and the advantages and disadvantages of their use.
07.02 List several client/server database products and the advantages and disadvantages of their use.
07.03 List factors that might determine the selection of a particular database product for a particular application.

08.0 Develop skills related to the process of determining an organization's current and future data storage needs as they relate to the organization of a database. — The student will be able to:

08.01 Analyze existing databases, paper-based databases, and business processes used to collect and utilize data.
08.02 Conduct interviews with database users and management in order to determine an organization's data management requirements and business rules.
08.03 Compile a list of the fundamental data requirements of an organization that can function as the starting point for the design of a new database.

09.0 Develop an understanding of database terminology related to conceptual database models and physical databases. — The student will be able to:

09.01 Define terms used to describe an Entity Relationship Model.
09.02 Define terms used to describe physical database values (e. g., null, not null, empty string, etc.).
09.03 Define terms related to the structure of a physical database.

09.04 Define terms related to the relationships of physical database structures.
09.05 Define terms related to general, physical (including data types, length, etc.), and logical field specification elements.

10.0 Design basic entity relationship models (ERMS) that accurately reflect the information needs of an organization. — The student will be able to:

10.01 Discuss the advantages and goals of conceptual modeling.
10.02 Determine the entities and attributes required to construct a particular ERM.
10.03 Determine the attribute or attributes that uniquely identify entities.
10.04 Determine the degree of the relationships (e.g., one-to-one, one-to-many, and many-to-many) and the optionality of relationships between the entities.
10.05 Resolve many-to-many relationships that can be resolved through the use of hidden entities.
10.06 Construct ERM diagrams that reflect the entities, attributes and relationships required to produce a conceptual model of a database.
10.07 Design ERMS that correctly model the dimension of time as required by transactions and/or the maintenance of historical data.
10.08 Design ERMS that correctly model network structures such as a Bill of Material.
10.09 Design ERMS that correctly model hierarchical structures.

11.0 Verify the ERM design by applying the rules of normalization (e. g. First, second and third normal form). — The student will be able to:

11.01 Discuss the principles, advantages, and purpose of database normalization.
11.02 Following the first normal form, verify that all attributes of an entity in an ERM are single-valued.
11.03 Following the second normal form, verify that all attributes of an entity in an ERM are dependent on the attribute(s) that uniquely identify the entity.
11.04 Following the third normal form, verify that no attribute that is not the unique identifier is dependent on any other attribute that is also not the unique identifier.

12.0 Create relational database tables based on ERMS using RDBMS software. — The student will be able to:

12.01 Create and configure the tables required to physically represent the entities depicted in an ERM.
12.02 Create, properly name, and configure the table columns to physically represent the attributes of an entity.
12.03 Map the relationships depicted in an ERM through the use of primary keys, foreign keys, and intersection (or linking) tables.
12.04 Apply necessary constraints by configuring column specifications.
12.05 Determine which columns are suitable for indexing and configure the proper type of index.

13.0 Test relational database designs by adding sample data to the database tables, verifying that data integrity is maintained and business rules are enforced. — The student will be able to:

13.01 Gather sample data and use an RDMS management tool to enter data into database tables.

13.02 Evaluate the database confirming that all required information is properly represented and business rules are enforced.
13.03 Evaluate the database assuring that no data redundancy exists in the database.
13.04 Evaluate the database assuring that no data is derivable from other data.
13.05 Discuss and defend the database design.

14.0 Demonstrate proficiency writing and executing SQL (structured query language) select statements to retrieve data using a SQL language interface and reporting tool. — The student will be able to:

14.01 Demonstrate proficiency customizing, configuring and using a SQL language interface and reporting tool.
14.02 Code and execute basic select statements that return a varying number of columns.
14.03 Code and execute select statements that limit the rows returned using a where clause with comparison and logical operators.
14.04 Code and execute select statements that sort data based on single and multiple columns using an order by clause.
14.05 Demonstrate the use of column aliases.
14.06 Use arithmetic operators in select statements to create expressions on numeric and date data.
14.07 Use concatenation operators in select statements to link columns and/or literal strings.
14.08 Use the distinct keyword in select statements to eliminate duplicate rows.
14.09 Use single rows functions in select statements in order to manipulate data values.
14.10 Use conversion functions in select statements in order to explicitly convert form one data type to another data type.
14.11 Code and execute select statements to access data from multiple tables using equality, non-equality and outer joins.
14.12 Code and execute select statements that perform self-joins.
14.13 Code and execute select statements that incorporate single-row and multiple-row subqueries.
14.14 Execute SQL statements that utilize group functions to aggregate data.

15.0 Demonstrate proficiency manipulating data by using data manipulation language (DML) statements and transaction control statements. — The student will be able to:

15.01 Code and execute DML statements to insert rows of data into an existing table.
15.02 Code and execute DML statements to modify and remove existing rows in a table.
15.03 Describe a database transaction and identify types of statement and conditions that will implicitly end a transaction.
15.04 Code and execute transaction control statements to explicitly end or rollback a transaction.

16.0 Demonstrate proficiency creating, altering and deleting database objects using sql data definition language (DDL) statements. — The student will be able to:

16.01 Describe the concept of database schema and access database objects that exist in different schemas.

16.02 Describe the primary types of database objects including tables, views, sequences, synonyms and indexes.
16.03 Code and execute DDL statement to create tables assigning proper data types and applying constraints.
16.04 Code and execute DDL statements to create, drop, and rename database objects.

17.0 Demonstrate an understanding of basic database security concepts. — The student will be able to:

17.01 Explain and describe the basic concepts of database system level security and database object level security.
17.02 Code and execute DCL (Data Control Language) statements to create users, grant privileges and revoke privileges on database objects.

18.0 Demonstrate the ability to develop data-centric programs to manipulate data using a language that extends SQL (such as PL/SQL). — The student will be able to:

18.01 Explain the benefits of using a language that extends SQL in order to achieve more sophisticated processing of data.
18.02 Properly name, declare and initialize variables and constants using the data types specified by the language.
18.03 Code and execute executable statements using proper syntax.
18.04 Use functions provided by the language that extend SQL including functions that convert data types.
18.05 Embed SQL select statements, DML statements and transaction control statements in blocks of code.
18.06 Use constructs such as if statements and loops to control program flow.
18.07 Utilize complex data types provided by the language as required.
18.08 Trap and handle exceptions.

19.0 Demonstrate the ability to create, execute and maintain database program units including stored procedures and database triggers. — The student will be able to:

19.01 Explain the uses and benefits of database stored procedures and triggers.
19.02 Create, execute and maintain database-stored procedures.
19.03 Create, execute and maintain database triggers.

37.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

37.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
37.02 Locate, organize and reference written information from various sources. CM 3.0
37.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
37.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
37.05 Apply active listening skills to obtain and clarify information. CM 7.0
37.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
37.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

38.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

- 38.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
- 38.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
- 38.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
- 38.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

39.0 Use information technology tools. – The student will be able to:

- 39.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
- 39.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
- 39.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
- 39.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

40.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

- 40.01 Describe the nature and types of business organizations. SY 1.0
- 40.02 Explain the effect of key organizational systems on performance and quality.
- 40.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
- 40.04 Explain the impact of the global economy on business organizations.

43.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

- 43.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
- 43.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
- 43.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
- 43.04 Interpret and explain written organizational policies and procedures. ELR 2.0

Course Number: CTS0013
Occupational Completion Point – C
Junior Application Developer – 400 Hours – SOC Code 15-1099.04

20.0 Demonstrate an understanding of basic concepts related to the development of software. — The student will be able to:

- 20.01 Demonstrate an understanding of computer hardware, a computer operating system, and software, as well as how these elements relate to each other.

20.02 Describe the basic differences between standard GUI (Graphical User Interface), text-based, and browser-based application interfaces.
20.03 Define an algorithm and explain how it relates to developing a computer program.
20.04 Explain how computers store numeric and character data.
20.05 Compare and contrast computer machine language and various high-level languages.

21.0 Demonstrate an understanding of the key features of a web/database connectivity middleware computer programming language. — The student will be able to:

21.01 Briefly describe the history of the development of a programming language.
21.02 Compare and contrast the advantages, disadvantages and key features of various Web/database connectivity middleware products and languages.
21.03 Use product documentation and Internet resources as research tools to obtain detailed information about a Web/database connectivity middleware product.

22.0 Write, compile (if applicable), and execute simple programs utilizing fundamental programming constructs. — The student will be able to:

22.01 Install and configure software tools for coding and managing programs (e.g., IDE or text editor).
22.02 Code and execute a basic program using proper formatting and syntax.
22.03 Include comments to embed explanatory information in a program.
22.04 Properly declare, assign values, and utilize variables and constants of various data types.
22.05 Build expressions using variables, literals and operators.
22.06 Code, call and utilize different types of methods (or functions), including those that use parameters and return values.
22.07 Display information using methods that print to the screen.
22.08 Use mathematical, assignment, comparison and logical operators to manipulate values and perform comparisons in program code.
22.09 Use conditional and nested conditional statements in program code.
22.10 Use for and while looping structures in program code.
22.11 Use nested loops that incorporate break/continue statements and labeled break/continues statements.
22.12 Use advanced conditional constructs such as switch statements.
22.13 Utilize debugging tools and techniques to locate the source of errors in program code.

23.0 Write programs that utilize arrays and other data structures (e.g., vectors, lists, structures etc.). — The student will be able to:

23.01 Create single and multidimensional arrays and other data structures particular to the language.
23.02 Assign values to arrays and other data structures particular to the language.
23.03 Access elements using associated methods both sequentially and randomly.

24.0 Design and develop programs structured on an object-oriented model. — The student will be able to:

24.01 Demonstrate an understanding of objects, how objects implement abstraction and encapsulation, and how objects interact with each other through messaging.
24.02 Declare classes from which objects can be instantiated that include constructors, instance variables (or attributes) and instance methods.
24.03 Instantiate objects from classes and call the instance methods in an object's class.
24.04 Explain the difference between primitive data types and object data types.
24.05 Derive new classes utilizing the concept of inheritance.
24.06 Design and code classes that contain static variables (or attributes) and static methods.
24.07 Utilize access modifiers to control access to variables and methods.
24.08 Design and code classes that utilize advanced Object Oriented concepts such as polymorphism, abstract classes and interfaces.
24.09 Develop a model for a simple application constructed from objects using a notational language such as UML.

25.0 Incorporate error handling in programs. — The student will be able to:

25.01 Identify common runtime errors and their basic causes.
25.02 Identify code blocks having the potential of producing a runtime error.
25.03 Incorporate error-handling code into programs to effectively catch and handle error conditions.

26.0 Write programs that write data to files and read data from files. — The student will be able to:

26.01 Demonstrate an understanding of file input and output, the use of streams and I/O errors.
26.02 Describe the difference between text files and binary files.
26.03 Code classes designed to write to and read from text files.
26.04 Code classes designed to write to and read from binary files.

41.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

41.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
41.02 Explain emergency procedures to follow in response to workplace accidents.
41.03 Create a disaster and/or emergency response plan. SHE 2.0

42.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

42.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
42.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
42.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
42.04 Employ mentoring skills to inspire and teach others. LT 5.0

44.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

44.01	Identify and demonstrate positive work behaviors needed to be employable.	ECD 1.0
44.02	Develop personal career plan that includes goals, objectives, and strategies.	ECD 2.0
44.03	Examine licensing, certification, and industry credentialing requirements.	ECD 3.0
44.04	Maintain a career portfolio to document knowledge, skills, and experience.	ECD 5.0
44.05	Evaluate and compare employment opportunities that match career goals.	ECD 6.0
44.06	Identify and exhibit traits for retaining employment.	ECD 7.0
44.07	Identify opportunities and research requirements for career advancement.	ECD 8.0
44.08	Research the benefits of ongoing professional development.	ECD 9.0
44.09	Examine and describe entrepreneurship opportunities as a career planning option.	ECD 10.0

45.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

45.01	Identify and describe the services and legal responsibilities of financial institutions.	FL 2.0
45.02	Describe the effect of money management on personal and career goals.	FL 3.0
45.03	Develop a personal budget and financial goals.	FL3.1
45.04	Complete financial instruments for making deposits and withdrawals.	FL3.2
45.05	Maintain financial records.	FL3.3
45.06	Read and reconcile financial statements.	FL3.4
45.07	Research, compare and contrast investment opportunities.	

Course Number: CTS0014
Occupational Completion Point – D
Web Application Developer – 400 Hours – SOC Code 15-1099.04

27.0 Demonstrate a basic understanding of the role of web/database connectivity middleware in the development of dynamic web content. – The student will be able to:

27.01 Describe the difference between static Web content and Web applications.
27.02 Describe the function of a Web server and how it processes static Web pages and dynamic Web pages.
27.03 Describe the characteristics of the HTTP protocol demonstrating an understanding of HTTP requests and HTTP responses.
27.04 Compare and contrast competing technologies and languages used to produce dynamic Web content.

28.0 Develop basic web applications. – The student will be able to:

28.01 Write dynamic code embedded within HTML/XHTML code utilizing fundamental elements such as variables, looping structures, conditional processing, data structures, etc.
28.02 Properly document code using comments and other standard methods.
28.03 Write code to validate and process HTML/XHTML form elements.

28.04 Incorporate error-handling techniques, including custom error pages, into a basic Web application.
28.05 Effectively troubleshoot Web application code by properly evaluating error messages generated by the language environment and the Web server.

29.0 Develop database-driven web applications. – The student will be able to:

29.01 Obtain and install database drivers.
29.02 Establish a connection with a database.
29.03 Write applications that incorporate SQL code to return and display a result set.
29.04 Write applications that insert, update, and delete data in the database.
29.05 Write applications that implement data drill-down interfaces and display returned data using “next-n” records pagination.
29.06 Effectively troubleshoot Web application code by properly evaluating error messages generated by the database driver.

30.0 Develop web applications that incorporate session tracking. – The student will be able to:

30.01 Describe the term “stateless” as it applies to the HTTP protocol and explain why session tracking is necessary.
30.02 List several common types of Web applications that require the use of session tracking.
30.03 Describe how sessions are tracked using cookies and URL rewriting.
30.04 Write code that can write, read, manipulate and delete cookies.
30.05 Create Web applications that utilize cookies for session tracking.
30.06 Create Web applications that utilize URL rewriting for session tracking.

31.0 Implement web application security techniques. - The student will be able to:

31.01 Describe basic concepts related to the SSL (Secure Sockets Layer) protocol.
31.02 Describe the process of authentication in providing a secure connection.
31.03 Identify common certificate authorities that issue digital secure certificates.
31.04 Write a Web application the uses form-based login authentication in combination with session tracking to restrict access.

32.0 Demonstrate the use of an architectural model to design web applications. – The student will be able to:

32.01 Identify and define the three logical tiers of a Web application: the presentation layer or view, the control layer, and the application logic layer.
32.02 Describe the benefits of the use of an architectural model in providing structure for a Web application.
32.03 Design and develop an application using an architectural model.

33.0 Demonstrate the ability to create and consume XML-based web services. – The student will be able to:

33.01 Define XML (Extensible Markup Language) and discuss its uses and benefits.
33.02 Write well-formed and valid XML markup.
33.03 Identify rendering and transformation techniques for XML.

33.04 Define the term “Web Service” and describe the use and benefits of XML-based Web Services.
33.05 Write a Web application that consumes an XML-based Web Service.
33.06 Create a basic XML-based Web Service.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Computer Systems Technology 1**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

PSAV	
Program Number	J500100
CIP Number	0647.010404
Grade Level	30, 31
Standard Length	900 hours
Teacher Certification	COMP SVC @7 G ELECTRONIC @7 G BUS MACH @7 G
CTSO	SkillsUSA, Inc.
SOC Codes	15-1041, 49-2011
Facility Code	212 http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp
Basic Skills Level	Mathematics: 10.0 Language: 9.0 Reading: 9.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to communication, leadership skills, human relations and employability skills; and safe, efficient work practices, installation, configuration, operation, and maintenance of computer/network systems. Content also includes preparation for industry-level certifications, network connectivity, LAN/WAN fundamentals, PC hardware/software, and advanced operating systems.

Program Structure

This program is a planned sequence of instruction consisting of three occupational completion points and is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44(3)(b), F.S.

The following table illustrates the program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	EEV0501	End User Support Technician	450	15-1041
B	EEV0502	PC Electronics Installer	150	49-2011
C	EEV0503	Computer Support Specialist	300	15-1041

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA), Business Professionals of America (BPA), and SkillsUSA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C. the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 10.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List

document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of

the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

This program (J500100), in combination with Computer Systems Technology 2 (J500200), has a statewide articulation agreement approved by the Articulation Coordinating Committee:

1. Computer Engineering Technology AS/AAS (1615040200/0615040200) – 9 credits (For PSAV programs including the 4-course Cisco Networking Academy, this program articulates an additional 12 credits.)

For details on articulation agreements which correlate to programs and industry certifications refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Demonstrate proficiency in software/hardware fundamentals.
02.0 Demonstrate proficiency in customer relations.
03.0 Demonstrate appropriate communication skills.
04.0 Demonstrate employability skills.
05.0 Demonstrate proficiency in basic laboratory practices.
06.0 Demonstrate proficiency in electronic fundamentals.
07.0 Demonstrate appropriate understanding of basic math.
08.0 Demonstrate appropriate understanding of basic science.
09.0 Demonstrate proficiency in computer systems.
10.0 Demonstrate proficiency in peripheral equipment.
11.0 Demonstrate language arts knowledge and skills.
12.0 Demonstrate mathematics knowledge and skills.
13.0 Demonstrate science knowledge and skills.
14.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
15.0 Solve problems using critical thinking skills, creativity and innovation.
16.0 Use information technology tools.
17.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
18.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
19.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
20.0 Describe the importance of professional ethics and legal responsibilities.
21.0 Explain the importance of employability skill and entrepreneurship skills.
22.0 Demonstrate personal money-management concepts, procedures, and strategies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Computer Systems Technology 1**
PSAV Number: **J500100**

Course Number: EEV0501
Occupational Completion Point: A
End User Support Technician – 450 Hours – SOC Code SOC 15-1041

01.0 Demonstrate proficiency in software/hardware fundamentals. – The student will be able to:

- 01.01 Apply OS commands, syntax usage and parameters.
- 01.02 Demonstrate knowledge of OS file systems.
- 01.03 Demonstrate basic command-line/GUI OS navigation
- 01.04 Demonstrate basic operation and usage of common applications.
- 01.05 Demonstrate operation and usage of fundamental OS utilities
- 01.06 Demonstrate operation and usage of virus protection software.
- 01.07 Demonstrate operation and usage of browser software and the internet.
- 01.08 Locate and install device drivers.
- 01.09 Understand compression technologies.
- 01.10 Identify PC/server front panel controls, indicators, rear case connectors and indicators.
- 01.11 Demonstrate an understanding of the boot process.

02.0 Demonstrate proficiency in customer relations. – The student will be able to:

- 02.01 Describe and demonstrate appropriate personal hygiene and professional attire.
- 02.02 Describe and demonstrate effective listening techniques.
- 02.03 Describe and apply techniques for instilling customer confidence and satisfaction.
- 02.04 Describe and apply techniques for keeping the customer informed.
- 02.05 Describe and apply effective follow-up techniques.
- 02.06 Demonstrate discretion in interacting with customers in field and business environments.
- 02.07 Demonstrate an understanding of basic conflict resolution.

03.0 Demonstrate appropriate communication skills. – The student will be able to:

- 03.01 Write logical and understandable statements, or phrases, to accurately fill out forms and invoices commonly used in business and industry.
- 03.02 Read and use graphs, charts, diagrams, tables, parts manuals, and information sources commonly used in this industry/occupational area.
- 03.03 Read and follow written and oral instructions.
- 03.04 Answer and ask questions coherently and concisely.
- 03.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
- 03.06 Demonstrate appropriate telephone/communication skills.

04.0 Demonstrate employability skills. – The student will be able to:

04.01 Prepare a resume.
04.02 Conduct a job search.
04.03 Secure information about a job.
04.04 Identify and provide documents, which may be required when interviewing for a job.
04.05 Complete a job application form correctly and completely.
04.06 Demonstrate competence in job interview techniques.
04.07 Identify and demonstrate appropriate responses to criticism from employer, supervisor or other employees.
04.08 Identify and demonstrate acceptable work habits.
04.09 Demonstrate knowledge of how to make job changes appropriately.
04.10 Demonstrate knowledge of employee health issues.
04.11 Demonstrate efficient organizational skills.
04.12 Demonstrate knowledge of the "Right-To-Know Law" as recorded in (29 CFR-1910.1200).

11.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

11.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
11.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5
11.03 Present information formally and informally for specific purposes and audiences. AF2.9

12.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

12.01 Demonstrate knowledge of arithmetic operations. AF3.2
12.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
12.03 Construct charts/tables/graphs using functions and data. AF3.5

13.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

13.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
13.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

14.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

14.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
14.02 Locate, organize and reference written information from various sources. CM 3.0
14.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
14.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
14.05 Apply active listening skills to obtain and clarify information. CM 7.0
14.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
14.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

15.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

15.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
15.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
15.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
15.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

16.0 Use information technology tools. – The student will be able to:

16.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
16.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
16.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
16.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

17.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

17.01 Describe the nature and types of business organizations. SY 1.0
17.02 Explain the effect of key organizational systems on performance and quality.
17.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
17.04 Explain the impact of the global economy on business organizations.

18.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

18.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
18.02 Explain emergency procedures to follow in response to workplace accidents.
18.03 Create a disaster and/or emergency response plan. SHE 2.0

19.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

19.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
19.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
19.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
19.04 Employ mentoring skills to inspire and teach others. LT 5.0

20.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

20.01	Evaluate and justify decisions based on ethical reasoning.	ELR 1.0
20.02	Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies.	ELR1.1
20.03	Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace.	ELR1.2
20.04	Interpret and explain written organizational policies and procedures.	ELR 2.0

21.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

21.01	Identify and demonstrate positive work behaviors needed to be employable.	ECD 1.0
21.02	Develop personal career plan that includes goals, objectives, and strategies.	ECD 2.0
21.03	Examine licensing, certification, and industry credentialing requirements.	ECD 3.0
21.04	Maintain a career portfolio to document knowledge, skills, and experience.	ECD 5.0
21.05	Evaluate and compare employment opportunities that match career goals.	ECD 6.0
21.06	Identify and exhibit traits for retaining employment.	ECD 7.0
21.07	Identify opportunities and research requirements for career advancement.	ECD 8.0
21.08	Research the benefits of ongoing professional development.	ECD 9.0
21.09	Examine and describe entrepreneurship opportunities as a career planning option.	ECD 10.0

22.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

22.01	Identify and describe the services and legal responsibilities of financial institutions.	FL 2.0
22.02	Describe the effect of money management on personal and career goals.	FL 3.0
22.03	Develop a personal budget and financial goals.	FL3.1
22.04	Complete financial instruments for making deposits and withdrawals.	FL3.2
22.05	Maintain financial records.	FL3.3
22.06	Read and reconcile financial statements.	FL3.4
22.07	Research, compare and contrast investment opportunities.	

Course Number: EEV0502
Occupational Completion Point: B
PC Electronics Installer – 150 Hours – SOC Code 49-2011

05.0 Demonstrate proficiency in basic laboratory practices. – The student will be able to:

05.01	Apply proper Occupational Safety Health Administration (OSHA) safety standards.
05.02	Make electrical/voice/data connections.
05.03	Identify and use hand tools properly.
05.04	Identify and use power tools properly.
05.05	Demonstrate acceptable soldering and desoldering and rework and repair techniques.
05.06	Demonstrate electrostatic discharge (ESD) safety procedures.

06.0 Demonstrate proficiency in electronic fundamentals. – The student will be able to:

06.01 06.01 Solve problems utilizing metric prefixes.
06.02 06.02 Identify sources of electricity.
06.03 06.03 Define voltage, current, resistance, power and energy.
06.04 06.04 Apply Ohm's law and power formulas.
06.05 06.05 Read and interpret color codes and symbols to identify electrical/electronic components and values.
06.06 06.06 Measure properties of a circuit using appropriate test equipment.
06.07 06.07 Identify properties of an AC signal.
06.08 06.08 Identify AC sources.
06.09 06.09 Analyze and measure AC voltages using appropriate test equipment.

07.0 Demonstrate appropriate understanding of basic math. – The student will be able to:

07.01 Solve problems for volume, weight, area and circumference and perimeter measurements for rectangles, square and cylinders.
07.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, and feet and inches.
07.03 Add, subtract, multiply and divide using fractions, decimals and whole numbers.
07.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
07.05 Demonstrate an understanding of federal, state and local taxes and their computation.

08.0 Demonstrate appropriate understanding of basic science. – The student will be able to:

08.01 Demonstrate an understanding of the effects of temperature extremes and moisture content in regards to computer/network equipment.
08.02 Demonstrate an understanding of the impact and effects of electrostatic discharge (ESD), power surges, grounding, and lighting strikes.
08.03 Apply the scientific method to draw conclusions or make interferences from data.
08.04 Demonstrate deductive reasoning techniques when troubleshooting.
08.05 Demonstrate an understanding of the effects of heat load and ventilation in regards to computer/network equipment.
08.06 Identify safety and health related issues, including exposure to work related chemicals and hazardous materials, and demonstrate the appropriate precautionary measures.
08.07 Demonstrate an understanding of environmental impact and regulations in regards to the appropriate disposal of computer/network equipment.

Course Number: EEV0503
Occupational Completion Point: C
Computer Support Specialist – 300 Hours – SOC Code 15-1041

09.0 Demonstrate proficiency in computer systems. – The student will be able to:

09.01 Interpret and understand computer system diagrams and technical literature.
09.02 Perform personal computer system tear-down, cleaning and inspection.

09.03 Upgrade and troubleshoot a variety of motherboards.
09.04 Demonstrate knowledge of bus systems and processor architecture.
09.05 Understand and troubleshoot memory systems.
09.06 Understand, troubleshoot and replace power supply systems.
09.07 Troubleshoot a microcomputer system.
09.08 Demonstrate system upgrading techniques.
09.09 Identify form factors: power supplies, motherboards, cases
09.10 Demonstrate proficiency in setup, configuring, upgrade and troubleshooting of laptop and mobile data devices.
09.11 Apply troubleshooting techniques using operating systems utilities.
09.12 Demonstrate the use of diagnostic software.
09.13 Install configure and troubleshooting operating systems.
09.14 Install configure and troubleshooting commonly used business applications.

10.0 Demonstrate proficiency in peripheral equipment. – The student will be able to:

10.01 Demonstrate an understanding of input/output devices.
10.02 Demonstrate proficiency installing and troubleshooting serial, parallel, USB, and IEEE 1394 devices.
10.03 Demonstrate proficiency installing, configuring, and troubleshooting video display technology eg projectors, monitors, LCD panels, data displays.
10.04 Demonstrate proficiency installing, configuring, and troubleshooting, telecommunications, network, and wireless devices.
10.05 Demonstrate proficiency installing, configuring, and troubleshooting, multimedia hardware and software.
10.06 Troubleshoot, installing hard drives and CD-R\RW\DVD.
10.07 Demonstrate proficiency installing, configuring and troubleshooting tape and other mass data storage devices.
10.08 Demonstrate proficiency installing, configuring, and troubleshooting printers.
10.09 Demonstrate professional connector assembly procedures.
10.10 Demonstrate proficiency in updating devices drivers.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Computer Systems Technology 2**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

PSAV	
Program Number	J500200
CIP Number	0647.010405
Grade Level	30, 31
Standard Length	750 hours
Teacher Certification	COMP SVC @7 G ELECTRONIC @7 G BUS MACH @7 G
CTSO	SkillsUSA, Inc.
SOC Codes	15-1071
Facility Code	212 http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp
Basic Skills Level	Mathematics: 10.0 Language: 9.0 Reading: 9.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to communication, leadership skills, human relations and employability skills; and safe, efficient work practices, installation, configuration, operation, and maintenance of computer/network systems. Content also includes preparation for industry-level certifications, network connectivity, LAN/WAN fundamentals, PC hardware/software, and advanced operating systems.

Program Structure

This program is a planned sequence of instruction consisting of two occupational completion points and is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44(3)(b), F.S.

The following table illustrates the program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	EEV0506	Field Service Technician	300	15-1071
B	EEV0508	Digital Electronics Technician	450	15-1071

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Future Business Leaders of America (FBLA), Business Professionals of America (BPA), and SkillsUSA are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C. the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 10.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List

document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

This program (J500200), in combination with Computer Systems Technology 1 (J500100), has a statewide articulation agreement approved by the Articulation Coordinating Committee:

1. Computer Engineering Technology AS/AAS (1615040200/0615040200) – 9 credits (For PSAV programs including the 4-course Cisco Networking Academy, this program articulates an additional 12 credits.)

For details on articulation agreements which correlate to programs and industry certifications refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Demonstrate proficiency in network fundamentals
02.0 Demonstrate proficiency in network equipment and physical site requirements and considerations.
03.0 Demonstrate proficiency in advanced computer concepts
04.0 Demonstrate proficiency in advanced operating systems
05.0 Demonstrate an understanding of entrepreneurship.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Computer Systems Technology 2**
PSAV Number: **J500200**

Course Number: EEV0506
Occupational Completion Point: A
Field Service Technician – 300 Hours – SOC Code 15-1071

01.0 Demonstrate Proficiency In Network Fundamentals. – The student will be able to:

- 01.01 Install, connect and maintain network clients and peripherals to various network operating systems.
- 01.02 Demonstrate use of file systems commands and utilities on a network server.
- 01.03 Demonstrate setup configuring and sharing of user security, file, printer and network resources.
- 01.04 Demonstrate setup configuring and troubleshooting network applications on the server.
- 01.05 Demonstrate setup configuring and troubleshoot backup operation on server/clients.
- 01.06 Demonstrate proficiency in performing help desk support for a network environment.
- 01.07 Connect, configure, and troubleshoot devices for network connectivity.
- 01.08 Perform basic network system maintenance.
- 01.09 Describe use and system maintenance of a LAN, WAN and telecommunications system.
- 01.10 Perform procedures related to administration of a secure network.
- 01.11 Demonstrate knowledge of the Internet/Intranet/Extranet system.
- 01.12 Demonstrate proficiency installing, configuring and troubleshooting network protocols.
- 01.13 Demonstrate knowledge of telecommunications services and standards.
- 01.14 Install, configure and troubleshoot browsers software.

02.0 Demonstrate Proficiency In Network Equipment And Physical Site Requirements And Considerations. – The student will be able to:

- 02.01 Demonstrate knowledge of data communication test equipment.
- 02.02 Demonstrate knowledge of telecommunication wiring systems.
- 02.03 Demonstrate knowledge of cable and LAN topology.
- 02.04 Demonstrate knowledge of broadband devices, hubs, switches and routers.
- 02.05 Calculate and determine and UPS requirements for an PC/network environment
- 02.06 Determine adequate and protected AC requirements for PC/LANs.
- 02.07 Calculate and determine physical requirements of a networking environment.
- 02.08 Install, configure and troubleshoot LAN cable systems (twisted pair, coax, or fiber).
- 02.09 Configure and troubleshoot patch bay and network equipment.

Course Number: EEV0508
Occupational Completion Point: B
Digital Electronics Technician – 450 Hours – SOC Code 15-1071

03.0 Demonstrate proficiency in advanced computer concepts. – The student will be able to:

- 03.01 Demonstrate knowledge of the OSI protocol model and the TCP/IP protocol.
- 03.02 Demonstrate use of utilities in troubleshooting a TCP/IP network
- 03.03 Demonstrate knowledge of TCP/IP application protocols and services, DNS, DHCP, FTP, HTTP, and LDAP
- 03.04 Demonstrate knowledge of simple proxy and firewall services.
- 03.05 Install, configure and troubleshoot the TCP/IP protocol service on a variety of operating systems.
- 03.06 Demonstrate knowledge of VLANs.
- 03.07 Install, configure and troubleshoot simple peer to peer networks.
- 03.08 Demonstrate knowledge of logon and logoff scripts.
- 03.09 Demonstrate knowledge of VPN and dial-up remote connectivity
- 03.10 Install and configure remote control software used in Help Desk operations.

04.0 Demonstrate proficiency in advanced operating systems. – The student will be able to:

- 04.01 Demonstrate knowledge of directory services in advanced operating systems.
- 04.02 Demonstrate knowledge of secure file systems used in an advance operating system.
- 04.03 Demonstrate knowledge of secure file, printer, and resource sharing in advanced operating systems.
- 04.04 Configure and troubleshoot access issues with secure file systems and secure file and resource sharing using advanced operating systems.
- 04.05 Install, configure advanced operating systems.
- 04.06 Troubleshoot boot, configuration, registry, and application problems typical in advanced operating systems.
- 04.07 Configure and troubleshoot network connectivity, protocols, network based printing.
- 04.08 Configure peer web-services, FTP, and telnet applications on advanced operating systems.
- 04.09 Schedule various preventative maintenance tasks for automatic execution in advanced operating systems.
- 04.10 Demonstrate knowledge of advance storage concepts, disk spanning, striping, mirroring, and striping with parity.
- 04.11 Configure advance storage methods using advanced operating systems.
- 04.12 Implement, monitor and troubleshoot security in advanced operating systems.

05.0 Demonstrate an understanding of entrepreneurship. – The student will be able to:

- 05.01 Identify characteristics of the American Enterprise System.
- 05.02 Define inflation and deflation.
- 05.03 Illustrate the basic economic questions facing any society.
- 05.04 Determine the results and change in demand or a change in supply.
- 05.05 List factors, which contribute to economic growth.
- 05.06 Identify characteristics of different types of business ownership.
- 05.07 Choose appropriate action in a situation requiring application of business ethics.

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Multimedia Design Technology 1**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

PSAV	
Program Number	Y600100
CIP Number	0510.019901
Grade Level	30, 31
Standard Length	750 hours
Teacher Certification	BUS ED 1 @2 VOE @7 TEACH CBE @7 ELECT DP @7 G BUS DP @ 7 G CLERICAL @7 G SECRETAR @7 G STENOG @4 TEC ELECT @7 G COMPU SCI 6 COMM ART @7 G TV PRO TEC @7 G I ART-TEC @1 @2 TEC ED 1 @2 PRINTING @7 G
CTSO	Phi Beta Lambda BPA
SOC Codes (all applicable)	27-1014
Facility Code	212 http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp
Basic Skills Level	Mathematics: 10.0 Language: 10.0 Reading: 10.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in digital media, new media, and multimedia positions in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to practical experiences in Web page design, interactive presentation development, testing and production. Specialized skills in multimedia presentations such as video editing, audio features, and simple animation and authoring software are used to produce a variety of interactive multimedia presentations.

Program Structure

This program is a planned sequence of instruction consisting of two occupational completion points.

When offered at the post secondary adult career and technical level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44(3)(b), F.S.

The following table illustrates the program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	OTA0040* GRA0005	BTE Core* Multimedia Production Assistant	150 150	27-1014
B	GRA0006	Multimedia Junior Designer	450	27-1014

* *Note: OTA0040 is a core program.*

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and Business Professionals of America (BPA) are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C. the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 9.0, Language 9.0, and Reading 9.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. Links to instructional resources in support of Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need

accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

This program (Y600100), in combination with the Multimedia Design Technology 2 program (Y600200) has a statewide articulation agreement approved by the Articulation Coordinating Committee:

1. Graphics Technology AS/AAS (0650040200/1650040200) – 9 credits

For details on articulation agreements which correlate to programs and industry certifications refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Standards

After successfully completing this program, the student will be able to perform the following:

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.

07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning though job shadowing, mentoring, e-coaching, etc.
08.0 Demonstrate personal and interpersonal skills appropriate for the workplace.
09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use Technology to apply and enhance communications skills in technical reading, writing.
04.0 Practice quality performance in the learning environment and the workplace.
05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
09.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
11.0 Perform e-mail activities.
12.0 Demonstrate operating systems.
13.0 Develop an awareness of emerging technologies.

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance and enhance personal performance in relation to the workplace. Apply ergonomic principles applicable to the configuration of computer workstations.
02.0 Demonstrate comprehension and communication skills.
03.0 Use technology to apply and enhance communication skills in technical reading, writing.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal and professional ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc.
10.0 Demonstrate personal and interpersonal skills and attributes appropriate for the workplace.
11.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance.
12.0 Perform e-mail activities.
13.0 Demonstrate operating systems.
14.0 Develop an awareness of emerging technologies.

OR

Introduction to IT Competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance.
02.0 Demonstrate Comprehension and communication skills.
03.0 Use technology to enhance the effectiveness of communication skills.
04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles.
05.0 Practice quality performance in the learning environment and the workplace.
06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance.
07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance.
08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals.
09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals.
10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace.
11.0 Participate in work-based learning experiences.
12.0 Perform e-mail activities.
13.0 Demonstrate knowledge of different operating systems.
14.0 Demonstrate proficiency navigating the internet, intranet, and the WWW.
15.0 Demonstrate proficiency using HTML commands.
16.0 Demonstrate proficiency in page design applicable to the WWW.
17.0 Demonstrate proficiency using specialized web design software.
18.0 Develop an awareness of the information technology industry.

19.0 Develop an awareness of microprocessors and digital computers.
20.0 Develop an awareness of programming languages.
21.0 Develop an awareness of emerging technologies.
22.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model.
23.0 Demonstrate proficiency using common software applications.
24.0 Demonstrate proficiency using specialized software applications.

Program Standards

25.0 Demonstrate knowledge of presentation production issues.
26.0 Demonstrate proficiency in using presentation software and equipment.
27.0 Demonstrate proficiency in Web page design applicable to the WWW.
28.0 Demonstrate an understanding of HTML commands.
29.0 Demonstrate proficiency in using a WYSIWG editor, Web design, or Web animation for Web page design.
30.0 Demonstrate language arts knowledge and skills.
31.0 Demonstrate mathematics knowledge and skills.
32.0 Demonstrate science knowledge and skills.
33.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
34.0 Solve problems using critical thinking skills, creativity and innovation.
35.0 Use information technology tools.
36.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
37.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
38.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
39.0 Describe the importance of professional ethics and legal responsibilities.
40.0 Explain the importance of employability skill and entrepreneurship skills.
41.0 Demonstrate personal money-management concepts, procedures, and strategies.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Multimedia Design Technology 1**
PSAV Number: **Y600100**

Course Number: OTA0040
Occupational Completion Point – A
Multimedia Production Assistant – 150 Hours – SOC Code 27-1014

Keyboarding and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

- 01.01 Develop keyboarding skills to enter and manipulate text and data.
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
- 01.03 Demonstrate basic file management skills.

02.0 Demonstrate comprehension and communication skills. – The student will be able to:

- 02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
- 02.02 Write clear and well-organized research papers, integrating a variety of information.
- 02.03 Prepare and deliver an oral report with appropriate materials to the class
- 02.04 Participate in large group discussions as a member and/or a leader.
- 02.05 Take notes, organize, summarize, and paraphrase ideas and details.
- 02.06 Accurately follow written and oral instructions.
- 02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

- 03.01 Select and use word processing software and accompanying features to enhance written business communications.
- 03.02 Use the writing process to create/edit business documents appropriate to the subject matter, purpose, and audience.
- 03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. Demonstrate initiative, courtesy, loyalty, honesty, cooperation and punctuality as a team member. – The

student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

05.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

07.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
07.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
07.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow up.)
07.04 Design, initiate, refine, and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.

08.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

08.01 Accept constructive criticism.
08.02 Apply appropriate strategies to manage and resolve conflict in work situations.
08.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

09.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

09.01 Perform business tasks (e.g., filing and records management, scheduling, reprographics, mail handling, etc.).
09.02 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

AND

Computer and Business Skills competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. Apply ergonomic principles applicable to the configuration of computer workstations. – The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic file management skills.
01.06 Troubleshoot problems with computer software, hardware, peripherals, and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Use technology to apply and enhance communication skills in technical reading, writing, speaking, listening, and viewing. – The student will be able to:

02.01 Take notes, organize, summarize, and paraphrase ideas and details.
02.02 Accurately follow written and oral instructions.
02.03 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to apply and enhance communication skills in technical reading, writing. – The student will be able to:

03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communications.
03.02 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.03 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Practice quality performance in the learning environment and the workplace. – The student will be able to:

04.01 Assess personal, peer, and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving and decision-making skills).
04.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

05.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. – The student will be able to:

05.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
05.02 Identify, analyze and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
05.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

06.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace and to accomplish job objectives and enhance workplace performance. – The student will be able to:

06.01 Analyze, interpret, compile and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
06.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
06.03 Select and use the correct mathematical processes and tools to solve complex problem settings that are typical of business settings and use formulas when appropriate.

07.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. – The student will be able to:

07.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.

07.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
07.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

08.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals. Experience work-based learning through job shadowing, mentoring, e-coaching, etc. – The student will be able to:

08.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
08.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
08.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, follow-up).
08.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
08.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
08.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
08.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
08.08 Build mentor relationships with local professionals in the industry.

09.0 Demonstrate personal and interpersonal skills appropriate for the workplace. – The student will be able to:

09.01 Accept constructive criticism.
09.02 Apply appropriate strategies to manage and resolve conflict in work situations.
09.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, and respect for self and others, professional dress, etc.).

10.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. – The student will be able to:

10.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

11.0 Perform e-mail activities. – The student will be able to:

11.01 Describe e-mail capabilities and functions.
11.02 Use the Internet to perform e-mail activities.

12.0 Demonstrate operating systems. – The student will be able to:

12.01 Identify operating system file naming conventions.

12.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
12.03 Demonstrate a working knowledge of standard file formats.
12.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

13.0 Develop an awareness of emerging technologies. – The student will be able to:

13.01 Compare and contrast various methods of evaluation for emerging technologies.
13.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
13.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Computing for College and Careers competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance-The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Demonstrate basic computer file management skills.
01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.07 Describe ethical issues and problems associated with computers and information systems.
01.08 Apply ergonomic principles applicable to the configuration of computer workstations.

02.0 Demonstrate comprehension and communication skills-The student will be able to:

02.01 Read and comprehend technical and non-technical reading assignments related to course content including trade journals, books, magazines and electronic sources.
02.02 Write clear and well-organized research papers, integrating a variety of information.
02.03 Prepare and deliver an oral report with appropriate materials to the class
02.04 Participate in large group discussions as a member and/or a leader.
02.05 Take notes, organize, summarize, and paraphrase ideas and details.
02.06 Accurately follow written and oral instructions.
02.07 Interpret data on graphs, charts, diagrams, and tables commonly used in this industry/occupation.

03.0 Use technology to enhance the effectiveness of communication skills-The student will be able to:

03.01 Select and use word processing software and accompanying features to enhance written business communications.
03.02 Use the writing process to create and edit business documents appropriate to the subject matter, purpose, and audience.
03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
03.04 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
03.05 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles-The student will be able to:

04.01 Explore, design, implement, and evaluate organizational structures and cultures for managing project teams.
04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace-The student will be able to:

05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance-The student will be able to:

06.01 Demonstrate an awareness of quality service and the personal and professional standards required to establish an effective service-based culture in the workplace, business, or learning environment.
06.02 Identify, analyze, and implement managerial skills necessary for maintaining a high quality work environment, goals, and strategic planning in business settings.
06.03 Follow accepted rules, regulations, policies, procedures, processes, and workplace safety.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance-The student will be able to:

- 07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals-The student will be able to:

- 08.01 Assess, analyze, and reassess individual talents, aptitudes, interests, and personal characteristics as they relate to potential future careers in business environments.
- 08.02 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
- 08.03 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals-The student will be able to:

- 09.01 Analyze personal skills and aptitudes in comparison with various business related job and career options.
- 09.02 Use career resources to develop an information base that reflects local and global business related occupations and opportunities for continuing education and workplace experience.
- 09.03 Demonstrate job-seeking skills required for entry-level employment (e.g., resume, application, interview, and follow-up).
- 09.04 Design and initiate a plan to facilitate growth and skill development related to anticipated job requirements and career expectations.
- 09.05 Refine and implement a plan to facilitate personal growth and skill development related to anticipated job requirements and career expectations.
- 09.06 Demonstrate an awareness of specific job requirements and career paths (e.g., requirements, characteristics needed) in business environments.
- 09.07 Demonstrate an awareness of the potential impact of local and global trends on career plans and life goals.
- 09.08 Build mentor relationships with local professionals in the industry.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace-The student will be able to:

- 10.01 Accept constructive criticism.
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations.

10.03 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Perform functions and responsibilities to accomplish job objectives and enhance workplace performance-The student will be able to:

11.01 Demonstrate knowledge of ethical behavior in a business environment (e.g., confidentiality of information, employee right to know, hiring practices, plagiarism, copyright violations, sexual harassment, mission statement, code of ethics, etc.).

12.0 Perform e-mail activities–The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Use the Internet to perform e-mail activities.

13.0 Demonstrate operating systems–The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Develop an awareness of emerging technologies-The student will be able to:

14.01 Compare and contrast various methods of evaluation for emerging technologies.
14.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
14.03 Compare and contrast emerging technologies (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

OR

Introduction to Information Technology competencies:

01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance — The student will be able to:

01.01 Develop keyboarding skills to enter and manipulate text and data.
01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks.
01.03 Identify and describe communications and networking systems used in workplace environments.
01.04 Use reference materials such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.
01.05 Troubleshoot problems with computer hardware peripherals and other office equipment.
01.06 Describe ethical issues and problems associated with computers and information systems.

02.0 Demonstrate comprehension and communication skills — The student will be able to:

- 02.01 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.02 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.03 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.04 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
- 02.05 Apply the writing process to the creation of appropriate documents following designated business formats.
- 02.06 Demonstrate an awareness of project management concepts and tools (e.g., timelines, deadlines, resource allocation, time management, delegation of tasks, collaboration, etc.).

03.0 Use technology to enhance the effectiveness of communication skills —The student will be able to:

- 03.01 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
- 03.02 Respond to and utilize information derived from multiple sources (e.g., written documents, instructions, e-mail, voice mail) to solve business problems and complete business tasks.

04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/ employee roles — The student will be able to:

- 04.01 Explore, design, implement, and evaluate organizational structures and cultures.
- 04.02 Explore and demonstrate an awareness of current trends in business and the employee's role in maintaining productive business environments in today's global workplace.
- 04.03 Collaborate with individuals and teams to complete tasks and solve business-related problems and demonstrate initiative, courtesy, loyalty, honesty, cooperation, and punctuality as a team member.

05.0 Practice quality performance in the learning environment and the workplace — The student will be able to:

- 05.01 Assess personal, peer and group performance and identify and implement strategies for improvement (e.g., organizational skills, note taking/outlining, advance organizers, reasoning skills, problem-solving skills, and decision-making skills).
- 05.02 Develop criteria for assessing products and processes that incorporate effective business practices (e.g., time management, productivity, total quality management).

06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance — The student will be able to:

06.01 Demonstrate awareness of the following workplace essentials: Quality customer service; business ethics; confidentiality of information; copyright violations; accepted workplace rules, regulations, policies, procedures, processes, and workplace safety, and appropriate attire and grooming.

07.0 Apply mathematical operations and processes as well as financial planning strategies to commonly occurring situations in the workplace to accomplish job objectives and enhance workplace performance — The student will be able to:

07.01 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
07.02 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
07.03 Select and use the correct mathematical processes and tools to solve complex problem situations that are typical of business settings and use formulas when appropriate.

08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals — The student will be able to:

08.01 Use personal assessment tools to identify personal strengths and weaknesses related to learning and work environments.
08.02 Analyze job and career requirements and relate career interests to opportunities in the global economy.

09.0 Incorporate knowledge gained from individual assessment and job/career exploration to design an individual career plan that reflects the transition from school to work, lifelong learning, and personal and professional goals — The student will be able to:

09.01 Research, compare, and contrast information technology career clusters (e.g., characteristics needed, skills required, education required, industry certifications, advantages and disadvantages of information technology careers, the need for information technology workers, etc.).
09.02 Describe the variety of occupations and professions within the world of information technology including those where information technology is either in a primary focus or in a supportive role.
09.03 Describe job requirements for the variety of occupations and professions within the global world of information technology.
09.04 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
09.05 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
09.06 Develop and maintain an electronic career portfolio, to include, but not limited to the Resume and Letter of Application.

10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace — The student will be able to:

10.01 Accept constructive criticism.
10.02 Demonstrate personal and interpersonal skills appropriate for the workplace (e.g., responsibility, dependability, punctuality, integrity, positive attitude, initiative, respect for self and others, professional dress, etc.).

11.0 Participate in work-based learning experiences — The student will be able to:

11.01 Participate in work-based learning experiences in an information technology environment.
11.02 Discuss the use of technology in an information technology environment.

12.0 Perform e-mail activities – The student will be able to:

12.01 Describe e-mail capabilities and functions.
12.02 Identify components of an e-mail message.
12.03 Identify the components of an e-mail address.
12.04 Identify when to use different e-mail options.
12.05 Attach a file to an e-mail message.
12.06 Forward an e-mail message.
12.07 Use an address book.
12.08 Reply to an e-mail message.
12.09 Use the Internet to perform e-mail activities.
12.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
12.11 Identify when to include information from an original e-mail message in a response.
12.12 Identify common problems associated with widespread use of e-mail.

13.0 Demonstrate knowledge of different operating systems – The student will be able to:

13.01 Identify operating system file naming conventions.
13.02 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
13.03 Demonstrate a working knowledge of standard file formats.
13.04 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

14.0 Demonstrate proficiency navigating the Internet, intranet, and the WWW – The student will be able to:

14.01 Identify and describe Web terminology.
14.02 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
14.03 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
14.04 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
14.05 Trace the evolution of the Internet from its inception to the present and into the future.
14.06 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).

14.07 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
14.08 Identify effective Boolean search strategies.

15.0 Demonstrate proficiency using HTML commands – The student will be able to:

15.01 Identify elements of a Web page.
15.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
15.03 Define basic HTML terminology.
15.04 Analyze HTML source code developed by others.
15.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, tables).
15.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
15.07 Edit and test HTML documents for accuracy and validity.
15.08 Use basic functions of WYSIWYG editors.
15.09 Use basic functions of HTML, DHTML, and XML editors and converters.
15.10 Enhance web pages through the addition of images and graphics including animation.

16.0 Demonstrate proficiency in page design applicable to the WWW – The student will be able to:

16.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
16.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
16.03 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD-ROMs).
16.04 Use image design software to create and edit images.
16.05 Demonstrate proficiency in publishing to the Internet.
16.06 Demonstrate proficiency in adding downloadable forms to web pages.
16.07 Explain the need for web-based applications.

17.0 Demonstrate proficiency using specialized web design software - The student will be able to:

17.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
17.02 Demonstrate proficiency using use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

18.0 Develop an awareness of the information technology industry - The student will be able to:

18.01 Explain how information technology impacts the operation and management of business and society.
18.02 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
18.03 Explain the emergence of a paperless society.

19.0 Develop an awareness of microprocessors and digital computers - The student will be able to:

19.01 Describe the evolution of the digital computer.
19.02 Explain the general architecture of a microcomputer system.
19.03 Explain the evolution of microprocessors.
19.04 Explain software hierarchy and its impact on microprocessors.
19.05 Explain the need for and use of peripherals.
19.06 Demonstrate proficiency using peripherals.
19.07 Identify the basic concepts of computer maintenance and upgrades.
19.08 Differentiate between diagnosing and troubleshooting.

20.0 Develop an awareness of programming languages - The student will be able to:

20.01 Explain the history of programming languages.
20.02 Explain the need for and use of compilers.
20.03 Explain how compilers work.
20.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

21.0 Develop an awareness of emerging technologies - The student will be able to:

21.01 Compare and contrast various methods of evaluation for emerging technologies.
21.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
21.03 Compare and contrast emerging technologies and describe how they impact business in the global marketplace (e.g., wireless, wireless web, cell phones, portables/handhelds, smart appliances, home networks, peer-to-peer, etc.).

22.0 Demonstrate an understanding of the seven layers of the open systems interface (OSI) model - The student will be able to:

22.01 Identify how types of networks and how they work.
22.02 Identify the role of servers and clients on a network.
22.03 Identify benefits and risks of networked computing.
22.04 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
22.05 Identify Intranets, Extranets and how they relate to the Internet.
22.06 Demonstrate basic understanding of network administration.
22.07 Describe the evolution of OSI from its inception to the present and into the future.
22.08 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

23.0 Demonstrate proficiency using common software applications - The student will be able to:

23.01 Compare and contrast the appropriate use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

23.02 Demonstrate proficiency in the use of various software applications (e.g., word processing, desktop publishing, graphics design, web browser, e-mail, presentation, database, scheduling, financial management, Java applet, music, etc.).

24.0 Demonstrate proficiency using specialized software applications - The student will be able to:

24.01 Compare and contrast the appropriate use of specialized software applications (e.g., (OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation process control, materials management, etc.).
24.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
24.03 Demonstrate the ability to incorporate digital sound.

Course Number: GRA0005
Occupational Completion Point – A
Multimedia Production Assistant – 150 Hours – SOC Code 27-1014

25.0 Demonstrate knowledge of presentation production issues—The student will be able to:

25.01 Identify characteristics of various types of presentations (informing, selling, teaching, entertaining)
25.02 Identify presentation materials (e.g.. handouts, seminar notebooks, business cards, coupons, etc.) and presentation marketing mediums (ex. print media such as newspaper, magazines; TV; movies; computer presentations; interactive CD ROM; kiosks, and Web pages, etc.)
25.03 Identify design characteristics (fonts, size and styles, backgrounds, etc.) that are suited for each type of presentation format and material.
25.04 Demonstrate knowledge of copyright laws including copyright statue, disclaimers, and filing procedures.
25.05 Research and identify skills needed for career positions in multimedia
25.06 Demonstrate an understanding of graphic and other file formats (e.g., EPS, TIFF, JPEG, ASCII, MPEG, MIDI, AVI, WAV, etc.) and knowledge of image size when scanning and saving files for use in different presentation types (Web, computer, print, etc.)
25.07 Demonstrate knowledge of presentation vocabulary/terms.

26.0 Demonstrate proficiency in using presentation software and equipment – The student will be able to:

26.01 Produce a presentation that includes music, animation, and digital photography and present it using a projection system.

30.0 Demonstrate language arts knowledge and skills. – The student will be able to: AF 2.0

30.01 Locate, comprehend and evaluate key elements of oral and written information. AF2.4
30.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF2.5

30.03 Present information formally and informally for specific purposes and audiences. AF2.9

31.0 Demonstrate mathematics knowledge and skills. – The student will be able to: AF3.0

31.01 Demonstrate knowledge of arithmetic operations. AF3.2
31.02 Analyze and apply data and measurements to solve problems and interpret documents. AF3.4
31.03 Construct charts/tables/graphs using functions and data. AF3.5

32.0 Demonstrate science knowledge and skills. – The student will be able to: AF4.0

32.01 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF4.1
32.02 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF4.3

Course Number: GRA0006
Occupational Completion Point – B
Multimedia Junior Designer – 450 Hours – SOC Code 27-1014

27.0 Demonstrate proficiency in web page design applicable to the WWW—The student will be able to:

27.01 Determine the objectives and the audience for Web pages.
27.02 Identify design strategies to reach and keep an audience
27.03 Use storyboarding to plan a Web site.
27.04 Create styles and other design elements (e.g. backgrounds, colors, fonts, buttons, etc.)

28.0 Demonstrate an understanding of HTML commands—The student will be able to:

28.01 Compare WYSIWG editors to non-WYSIWG coding.
28.02 Interpret HTML coding on an existing Web page.
28.03 Use HTML commands to write a Web page.

29.0 Demonstrate proficiency in using a WYSIWG editor, web design, or web animation software for web page design—The student will be able to:

29.01 Create Web pages for publication.
29.02 Apply style sheets for consistent Web site design.
29.03 Format text for Web pages (e.g., font families, sizes)
29.04 Create and edit images, photographs for Web pages using digital imaging software (e.g. ImageReady in Photoshop).
29.05 Insert created buttons into a Web page and test for accuracy
29.06 Create navigational links.
29.07 Insert audio files into a Web page.
29.08 Create, edit and integrate video files into a Web page.
29.09 Create, edit and integrate animation files into a Web page.
29.10 Create Meta commands and key words for search engines.

29.11 Optimize page size for effective downloading to browsers.
29.12 Create and incorporate a form in a Web page.
29.13 Edit and test links for accuracy and validity.
29.14 Optimize images to make them "Web ready".
29.15 Demonstrate knowledge of image formats related to photos and graphics on the Internet (e.g. Graphic formats (Tiff & EPS), Web formats (JEPG, GIF, PNG), etc.
29.16 Demonstrate an understanding of photograph compression factors such as transmission speed, color reduction, and browser support.
29.17 Save and export a photograph to the Web in the format best for image quality and file size.
29.18 Demonstrate knowledge of the terms and vocabulary used with the animation process, animation software, and types of animation (e.g. 2D vs. 3D, Cel and Keyframe animation).

33.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas. – The student will be able to:

33.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
33.02 Locate, organize and reference written information from various sources. CM 3.0
33.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
33.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
33.05 Apply active listening skills to obtain and clarify information. CM 7.0
33.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
33.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0

34.0 Solve problems using critical thinking skills, creativity and innovation. – The student will be able to:

34.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS1.0
34.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
34.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
34.04 Conduct technical research to gather information necessary for decision-making.PS 4.0

35.0 Use information technology tools. – The student will be able to:

35.01 Use personal information management (PIM) applications to increase workplace efficiency. IT 1.0
35.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
35.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
35.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

36.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. – The student will be able to:

36.01 Describe the nature and types of business organizations. SY 1.0
36.02 Explain the effect of key organizational systems on performance and quality.
36.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
36.04 Explain the impact of the global economy on business organizations.

37.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. – The student will be able to:

37.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0
37.02 Explain emergency procedures to follow in response to workplace accidents.
37.03 Create a disaster and/or emergency response plan. SHE 2.0

38.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives. – The student will be able to:

38.01 Employ leadership skills to accomplish organizational goals and objectives. LT1.0
38.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT3.0
38.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
38.04 Employ mentoring skills to inspire and teach others. LT 5.0

39.0 Describe the importance of professional ethics and legal responsibilities. – The student will be able to:

39.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
39.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR1.1
39.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR1.2
39.04 Interpret and explain written organizational policies and procedures. ELR 2.0

40.0 Explain the importance of employability skill and entrepreneurship skills. – The student will be able to:

40.01 Identify and demonstrate positive work behaviors needed to be employable. ECD 1.0
40.02 Develop personal career plan that includes goals, objectives, and strategies. ECD 2.0
40.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
40.04 Maintain a career portfolio to document knowledge, skills, and experience. ECD 5.0
40.05 Evaluate and compare employment opportunities that match career goals. ECD 6.0
40.06 Identify and exhibit traits for retaining employment. ECD 7.0
40.07 Identify opportunities and research requirements for career advancement. ECD 8.0
40.08 Research the benefits of ongoing professional development. ECD 9.0
40.09 Examine and describe entrepreneurship opportunities as a career planning option. ECD 10.0

41.0 Demonstrate personal money-management concepts, procedures, and strategies. – The student will be able to:

41.01	Identify and describe the services and legal responsibilities of financial institutions.	FL 2.0
41.02	Describe the effect of money management on personal and career goals.	FL 3.0
41.03	Develop a personal budget and financial goals.	FL3.1
41.04	Complete financial instruments for making deposits and withdrawals.	FL3.2
41.05	Maintain financial records.	FL3.3
41.06	Read and reconcile financial statements.	FL3.4
41.07	Research, compare and contrast investment opportunities.	

2011 – 2012

Florida Department of Education
Curriculum Framework

Program Title: **Multimedia Design Technology 2**
Program Type: **Career Preparatory**
Career Cluster: **Information Technology**

PSAV	
Program Number	Y600200
CIP Number	0510.019902
Grade Level	30, 31
Standard Length	600 hours
Teacher Certification	BUS ED 1 @2 VOE @7 TEACH CBE @7 ELECT DP @7 G BUS DP @ 7 G CLERICAL @7 G SECRETAR @7 G STENOG @4 TEC ELECT @7 G COMPU SCI 6 COMM ART @7 G TV PRO TEC @7 G I ART-TEC @1 @2 TEC ED 1 @2 PRINTING @7 G
CTSO	Phi Beta Lambda BPA
SOC Codes (all applicable)	27-1014
Facility Code	212 http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp
Basic Skills Level	Mathematics: 10.0 Language: 10.0 Reading: 10.0

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in digital media, new media, and multimedia positions in the Information Technology career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Information Technology career cluster.

The content includes but is not limited to practical experiences in Web page design, interactive presentation development, testing and production. Specialized skills in multimedia presentations such as video editing, audio features, and simple animation and authoring software are used to produce a variety of interactive multimedia presentations.

Program Structure

This program is a planned sequence of instruction consisting of three occupational completion points.

When offered at the post secondary adult career and technical level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44(3)(b), F.S.

The following table illustrates the program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	GRA0007	Multimedia Designer	150	27-1014
B	GRA0008	Multimedia Producer	300	27-1014
C	GRA0009	Multimedia Specialist	150	27-1014

** Note: Multimedia Design Technology 1 should be completed prior to enrolling in this program..*

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

Phi Beta Lambda and Business Professionals of America (BPA) are the appropriate career and technical student organizations for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the program-specific OJT framework apply.

There is a **Cooperative Education Manual** available on-line that has guidelines for students, teachers, employers, parents and other administrators and sample training agreements. It can be accessed on the DOE website at http://www.fldoe.org/workforce/programs/doc/coopm.doc.

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C. the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 10.0, Language 10.0, and Reading 10.0. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination. Students may be exempt from meeting the Basic Skills requirements by earning an eligible industry certification. See the Basic Skills Exemption List document for a list of eligible industry certifications (http://www.fldoe.org/workforce/dwdframe/rtf/basic-skills.rtf).

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination pursuant to Section 1008.29, F.S.; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.)

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their postsecondary service provider. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (ESE) will need modifications to meet their special needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular occupational completion point (OCP) or a modified occupational completion point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP(s)/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

This program (Y600200), in combination with the Multimedia Design Technology 1 program (Y600100) has a statewide articulation agreement approved by the Articulation Coordinating Committee:

1. Graphics Technology AS/AAS (0650040200/1650040200) – 9 credits

For details on articulation agreements which correlate to programs and industry certifications refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Standards

After successfully completing this program, the student will be able to perform the following:

01.0 Demonstrate proficiency in using presentation software and equipment
02.0 Demonstrate proficiency using video editing software and equipment.
03.0 Demonstrate Proficiency in using presentation software and equipment.
04.0 Develop proficiency in using authoring software.
05.0 Participate in work-based learning experiences.
06.0 Apply job readiness, career planning and job seeking skills to obtain personal and professional goals.

2011 – 2012

Florida Department of Education
Student Performance Standards

Program Title: **Multimedia Design Technology 2**
PSAV Number: **Y600200**

Course Number: GRA0007
Occupational Completion Point – A
Multimedia Designer – 150 Hours – SOC Code 27-1014

01.0 Demonstrate proficiency in using presentation software and equipment The student will be able to:

- 01.01 Using presentation software, create a multimedia presentation that incorporates shot and edited video, animation, music, narration and adheres to good design principles, use of transitions, and effective message conveyance.
- 01.02 Demonstrate knowledge of the roles and responsibilities of a multimedia production team (e.g. project manager, creative or design director, content experts, writers, graphic designers, animators, sound designers, videographer, interface designers/programmers, etc.)
- 01.03 Collaborate with team members to plan, edit, evaluate, and present a multimedia presentation.

02.0 Demonstrate proficiency using video editing software and equipment – The student will be able to:

- 02.01 Demonstrate knowledge of video and sound editing vocabulary, terms, and acronyms.
- 02.02 Demonstrate knowledge of non-linear editing software (NLEs) and compare the strengths and weaknesses of these programs.
- 02.03 Identify components of non-linear video editing equipment
- 02.04 Set-up non-linear video editing equipment
- 02.05 Compare offline to “real time” video editing
- 02.06 Use storyboarding to plan a short nonlinear video project that includes existing video footage with a title, transitions, background sound, voice-over, animation, and rolling credits.
- 02.07 Create and edit a movie using video editing software that includes existing video footage with a title, transitions, background sound, voice-over, and rolling credits and output to video.
- 02.08 Collaborate with team members to create a short movie utilizing good lighting and sound: plan, shoot, and edit video footage as a team.
- 02.09 Using a video editor, create animated GIFs.
- 02.10 Collaborate with team members to plan, edit, and shoot video footage utilizing advanced video editing techniques and output to video.
- 02.11 Discuss the use of batch processing and project trimming
- 02.12 Plan, create, edit and present a short nonlinear QuickTime movie with title, transitions, sub and virtual clips, sound, background music, voice-over, and credits.

Course Number: GRA0008
Occupational Completion Point – B
Multimedia Producer – 300 Hours – SOC Code 27-1014

03.0 Demonstrate proficiency in using presentation software and equipment–The student will be able to:

- 03.01 Create a self-running presentation with synchronized audio, convert presentation slides into streaming ASF files for use on the Web.

04.0 Develop proficiency in using authoring software—The student will be able to:

- 04.01 Plan interactive projects for use in a kiosk, CD, DVD, E-merchandizing, computer-based presentation or training or corporate presentation
- 04.02 Use authoring software to create an interactive project for use in a kiosk, CD, DVD, merchandizing application, computer-based training or corporate presentation.
- 04.03 Have the created interactive project evaluated and tested by users and make modifications to improve the project.
- 04.04 Collaborate with team members to plan, edit, evaluate, and present a multimedia interactive presentation or product.

05.0 Participate in work-based learning experiences—The student will be able to:

- 05.01 Participate in work-based learning experiences in a multimedia environment.

Course Number: GRA0009
Occupational Completion Point – C
Multimedia Specialist – 150 Hours – SOC Code 27-1014

06.0 Apply job readiness, career planning and job seeking skills to obtain personal and professional goals—The student will be able to:

- 06.01 Create a digital resume
- 06.02 Create a digital portfolio
- 06.03 Market multimedia production skills for employment