

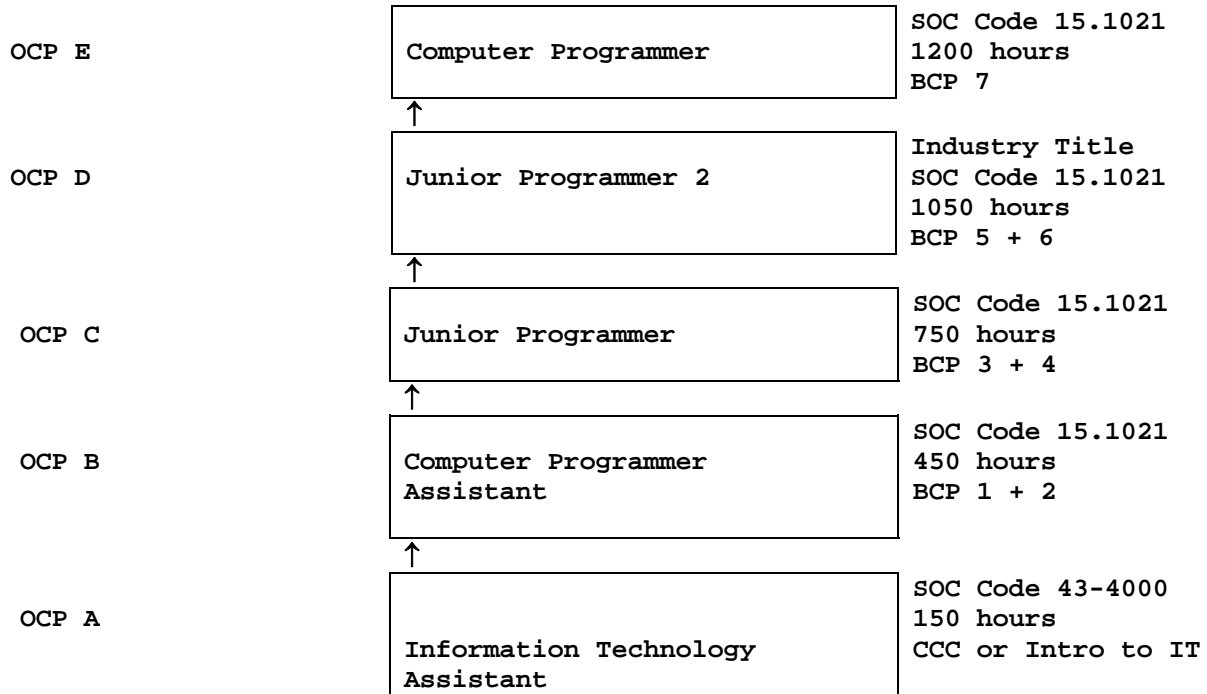


computer programming industry: planning; management; finance; technical and production skills; underlying principles of technology; labor issues; community issues; and health, safety, and environmental issues.

- II. **PROGRAM STRUCTURE:** This program is a planned sequence of instruction consisting of the Business Technology Education Core (Computing for College and Careers 1 - OCP A) 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.

The following diagram illustrates the Business Computer Programming program structure:

**Computer Technology Cluster  
Secondary and Postsecondary Adult Vocational**



When offered at the secondary level, this program consists of the following courses which include the Business Technology Education Core:

- Business Technology Education Core
  - 8209020 - Computing for College and Careers (Computing for College and Careers)
- OR
- 8207310 - Introduction to Information Technology
- 8206010 - Business Computer Programming 1
- 8206020 - Business Computer Programming 2
- 8206030 - Business Computer Programming 3
- 8206040 - Business Computer Programming 4

- 8206050 - Business Computer Programming 5
- 8206060 - Business Computer Programming 6
- 8206070 - Business Computer Programming 7

III. **LABORATORY ACTIVITIES:** Laboratory activities are an integral part of this program and may include the use of keyboarding systems; data entry devices; local area networks; and microcomputer, midrange, and mainframe computer systems.

IV. **SPECIAL NOTES:** Future Business Leaders of America (Secondary), Phi Beta Lambda (Postsecondary), and Business Professionals of America are the appropriate Career Student Organizations (CSO) for providing leadership training and for reinforcing specific career and technical skills. Career Student Organizations, when provided, shall be an integral part of the career and technical instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, FAC.

Cooperative training - OJT is appropriate for this program. Whenever cooperative training - OJT is offered, the following are required for each student: a training plan, signed by the student, teacher, and employer, which includes instructional objectives and a list of on-the-job and in-school learning experiences; a workstation that reflects equipment, skills, and tasks that are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

In accordance with Rule 6A-10.040, FAC., the minimum basic skills grade levels required for postsecondary adult vocational students is: 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.

This program may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 230.643 F.S.

The standard length of this program is 1200 hours.

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 program or course articulation agreements with each other.

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Adult students with disabilities must self-identify and request such services. 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.

SCANS Competencies: Instructional strategies for this program must include methods that require students to identify, organize, and use resources appropriately; to work with each other cooperatively and productively; to acquire and use information; to understand social, organizational, and technological systems; and to work with a variety of tools and equipment. Instructional strategies must also incorporate the methods to improve students' personal qualities and high-order thinking skills.

21<sup>st</sup>-Century Skills: Instructional strategies for this program must include methods that require students to acquire 1. Digital-Age Literacy - basic scientific, mathematical, and technological literacies - visual and information literacies - cultural literacy and global awareness; 2. Inventive Thinking - adaptability/ability to manage complexity - curiosity, creativity, and risk taking - higher order thinking and sound reasoning; 3. Effective Communication - teaming, collaboration, and interpersonal skills - personal and social responsibility - interactive communication; 4. High Productivity - ability to prioritize, plan, and manage for results - effective use of real-world tools - relevant, high-quality products.

Equipment List: A generic equipment list is available for this program.

- V. **INTENDED OUTCOMES**: After completion of the following outcomes, the student will be able to:

**OCCUPATIONAL COMPLETION POINT - DATA CODE A**  
**Information Technology Assistant- SOC Code 43-4000**

Computing for College and Careers Competencies:

- 01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. [Student Performance Standards: 01.01, 01.02, 01.03, 01.04, 01.05, 01.06, 01.07, 01.08.]
- 02.0 Demonstrate comprehension and communication skills. [Student Performance Standards: 02.01, 02.02, 02.04, 02.05, 02.05, 02.06, 02.07.]
- 03.0 Use technology to apply and enhance communication skills in technical reading, writing. [Student Performance Standards: 03.01, 03.02, 03.03, 03.05, 03.06.]
- 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. [Student Performance Standards: 04.01, 04.02, 04.03.]
- 05.0 Practice quality performance in the learning environment and the workplace. [Student Performance Standards: 05.01, 05.02.]
- 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. [Student Performance Standards: 06.01, 06.02, 06.03.]
- 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. [Student Performance Standards: 07.01, 07.02, 07.03.]
- 08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. [Student Performance Standards: 08.01, 08.02, 08.03.]
- 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. [Student Performance Standards: 09.01,09.02, 09.03, 09.04, 09.05, 09.06, 09.07, 09.08.]
- 10.0 Demonstrate personal and interpersonal skills and attributes appropriate for the workplace. [Student Performance Standards: [10.01, 10.02, 10.03.]
- 13.0 Perform office functions and responsibilities to accomplish job objectives and enhance workplace performance. [Student Performance Standards: 13.02.]
- 41.0 Perform e-mail activities. [Student Performance Standards: 41.01, 41.09.]
- 42.0 Demonstrate operating systems. [Student Performance Standards: 42.01, 42.10, 42.12, 42.14.]
- 67.0 Develop an awareness of emerging technologies. [Student Performance Standards: 67.01, 67.02, 67.03.]

OR

**Introduction to IT Competencies:**

- 01.0 Demonstrate knowledge, skill, and application of information systems to accomplish job objectives and enhance workplace performance. [Student Performance Standards: 01.01, 01.02, 01.03, 01.04, 01.06, 01.07.]
- 02.0 Demonstrate Comprehension and communication skills. [Student Performance Standards: 02.03, 02.62, 02.63, 02.64, 02.65, 02.66.]
- 03.0 Use technology to enhance the effectiveness of communication skills. [Student Performance Standards: 03.03, 03.06.]
- 04.0 Develop an awareness of management functions and organizational structures as they relate to today's workplace and employer/employee roles. [Student Performance Standards: 04.01, 04.02.]
- 05.0 Practice quality performance in the learning environment and the workplace. [Student Performance Standards: 05.01, 05.02.]
- 06.0 Incorporate appropriate leadership and supervision techniques, customer service strategies, and standards of personal ethics to accomplish job objectives and enhance workplace performance. [Student Performance Standards: 06.03.]
- 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. [Student Performance Standards: 07.01, 07.02, 07.03.]
- 08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal development, and life goals. [Student Performance Standards: 08.02, 08.03.]

- 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. [Student Performance Standards: 09.15, 09.16, 09.17, 09.18, 09.19, 09.20.]
- 10.0 Demonstrate human relations/interpersonal skills appropriate for the workplace. [Student Performance Standards: 10.01, 10.03.]
- 20.0 Participate in work-based learning experiences. [Student Performance Standards: 20.44, 20.46.]
- 41.0 Perform e-mail activities. [Student Performance Standards: 41.01, 41.02, 41.03, 41.04, 41.05, 41.06, 41.07, 41.08, 41.09, 41.10, 41.11, 41.12, 41.13.]
- 42.0 Demonstrate knowledge of different operating systems. [Student Performance Standards: 42.01, 42.10, 42.12, 42.14.]
- 55.0 Demonstrate proficiency navigating the internet, intranet, and the WWW. [Student Performance Standards: 55.01, 55.10, 55.11, 55.14, 55.15, 55.16, 55.17, 55.18.]
- 56.0 Demonstrate proficiency using HTML commands. [Student Performance Standards: 56.01, 56.02, 56.03, 56.04, 56.05, 56.06, 56.08, 56.17, 56.18, 56.19.]
- 57.0 Demonstrate proficiency in page design applicable to the WWW. [Student Performance Standards: 57.01, 57.02, 57.04, 57.05, 57.25, 57.26, 57.27.]
- 63.0 Demonstrate proficiency using specialized web design software. [Student Performance Standards: 63.01, 63.02.]
- 64.0 Develop an awareness of the information technology industry. [Student Performance Standards: 64.01, 64.04, 64.05.]
- 65.0 Develop an awareness of microprocessors and digital computers. [Student Performance Standards: 65.01, 65.02, 65.03, 65.04, 65.05, 65.06, 65.07, 65.08.]
- 66.0 Develop an awareness of programming languages. [Student Performance Standards: 66.01, 66.02, 66.03, 66.04.]
- 67.0 Develop an awareness of emerging technologies. [Student Performance Standards: 67.01, 67.02, 67.03.]
- 69.0 Demonstrate an understanding of the seven layers of the Open Systems Interface (OSI) model. [Student Performance Standards: 69.01, 69.02, 69.04, 69.06, 69.07, 69.08, 69.09, 69.11.]
- 70.0 Demonstrate proficiency using common software applications. [Student Performance Standards: 70.01, 70.02.]
- 71.0 Demonstrate proficiency using specialized software applications. [Student Performance Standards: 71.01, 71.02, 71.06.]

**OCCUPATIONAL COMPLETION POINT - DATA CODE B**  
**COMPUTER PROGRAMMER ASSISTANT - SOC Code 15.1021**

Intended outcomes of OCP A must be completed previously or concurrently. After completing the following additional competencies in a single language, as appropriate, the student will have achieved the occupational completion point of Computer Programmer Aide and the student will be able to:

- 08.0 Assess personal strengths and weaknesses as they relate to job objectives, career exploration, personal develop, and life goals. [Student Performance Standards: 08.06, 08.07, 08.08, 08.09]
- 20.0 Participate in work-based learning experiences. [Student Performance Standards: 20.25, 20.26, 20.27]
- 23.0 Identify functions of information processing. [Student

- Performance Standards: 23.01, 23.02, 23.03, 23.04, 23.05, 23.06, 23.07, 23.08, 23.09, 23.10, 23.11, 23.12, 23.13]
- 24.0 Identify functions of computers. [Student Performance Standards: 24.01, 24.02, 24.03, 24.04, 24.05, 24.06]
  - 25.0 Test programs. [Student Performance Standards 25.01, 25.03, 25.04, 25.05, 25.06, 25.07, 25.08, 25.09]
  - 26.0 Plan program design. [Student Performance Standards: 26.01, 26.02, 26.03, 26.04, 26.05, 26.07]
  - 27.0 Code programs. [Student Performance Standards: 27.01, 27.02, 27.03, 27.04, 27.05, 27.07, 27.08, 27.09, 27.10]
  - 28.0 Perform program maintenance. [Student Performance Standards: 28.01, 28.02, 28.03, 28.04, 28.05]
  - 29.0 Create and maintain documentation. [Student Performance Standards: 29.01, 29.02, 29.03]
  - 30.0 Evaluate assigned business computer programming tasks.[Student Performance Standard: 30.01]
  - 31.0 Develop an understanding of basic financial business concepts. [Student Performance Standards: 31.01, 31.02]
  - 32.0 Understand the integrated nature of corporate systems. [Student Performance Standards: 32.01, 32.02]
  - 33.0 Demonstrate an understanding of operating systems, environments, and platforms. [Student Performance Standards: 33.01, 33.02, 33.03]
  - 34.0 Develop an awareness of software quality assurance. [Student Performance Standards: 34.01, 34.03, 34.04]
  - 35.0 Implement enhanced program structures. [Student Performance Standards: 35.01, 35.02, 35.03, 35.04, 35.05, 35.06, 35.08, 35.10, 35.11, 35.12]
  - 36.0 Develop an understanding of programming techniques and concepts. [Student Performance Standards: 36.01, 36.02, 36.04, 36.06, 36.07]

**OCCUPATIONAL COMPLETION POINT - DATA CODE C  
JUNIOR PROGRAMMER - SOC Code 15.1021**

Intended outcomes of OCP A and OCP B must be completed previously or concurrently. After completing the following competencies in a single language, as appropriate, the student will have achieved the occupational completion point of Junior Programmer and the student will be able to:

- 20.0 Participate in work-based learning experiences. [Student Performance Standards: 20.25, 20.26, 20.27, 20.28]
- 23.0 Identify functions of information processing. [Student Performance Standards: 23.11, 23.12]
- 24.0 Identify functions of computers. [Student Performance Standard: 24.07]
- 25.0 Test programs. [Student Performance Standard: 25.02]
- 26.0 Plan program design. [Student Performance Standard: 26.06]
- 27.0 Code programs. [Student Performance Standard: 27.06]
- 28.0 Perform program maintenance. [Student Performance Standards: 28.06, 28.07]
- 30.0 Evaluate assigned business computer programming tasks. [Student Performance Standards: 30.02, 30.03]
- 34.0 Develop an awareness of software quality assurance. [Student Performance Standard: 34.02]
- 35.0 Implement enhanced program structures. [Student Performance

Standards: 35.07, 35.09, 35.14, 35.15]

- 36.0 Develop an understanding of programming techniques and concepts.  
[Student Performance Standards: 36.03, 36.05]

**OCCUPATIONAL COMPLETION POINT - DATA CODE D**  
**JUNIOR PROGRAMMER 2 - SOC Code 15.1021**

Intended outcomes of OCP A, OCP B, and OCP C must be completed previously. After completing the following competencies in **two or more languages**, the student will have achieved the occupational completion point of Computer Programming Specialist and the student will be able to:

- 25.0 Test programs. [Student Performance Standards: 25.01, 25.02, 25.03, 25.04, 25.05, 25.06, 25.07, 25.08, 25.09]
- 26.0 Plan program design. [Student Performance Standards: 26.01, 26.02, 26.03, 26.04, 26.05 26.07]
- 27.0 Code programs. [Student Performance Standards: [27.01, 27.02, 27.03, 27.04, 27.05, 27.07, 27.08, 27.09, 27.10]
- 28.0 Perform program maintenance. [Student Performance Standards: [28.01, 28.02, 28.03, 28.04, 28.05, 28.06, 28.07]
- 29.0 Create and maintain documentation. [Student Performance Standards: 29.01, 29.02, 29.03]
- 30.0 Evaluate assigned business computer programming tasks. [Student Performance Standards: [30.02, 30.03]
- 33.0 Demonstrate an understanding of operating systems, environments, and platforms. [Student Performance Standards: [33.02, 33.04]
- 34.0 Develop an awareness of software quality assurance. [Student Performance Standards: [34.02]
- 35.0 Implement enhanced program structures. [Student Performance Standards: [35.01, 35.02, 35.03, 35.04, 35.05, 35.06, 35.07, 35.23, 35.08, 35.09, 35.10, 35.11, 35.12, 35.14, 35.15, 35.16]
- 36.0 Develop an understanding of programming techniques and concepts.  
[Student Performance Standards: [36.05]

**OCCUPATIONAL COMPLETION POINT - DATA CODE E**  
**COMPUTER PROGRAMMER - SOC Code 15.1021**

Intended outcomes of OCP A, OCP B, OCP C, and OCP D must be completed previously. After completing the following competencies in **two or more languages**, the student will have achieved the occupational completion point of Computer Programmer and the student will be able to:

- 25.0 Test programs. [Student Performance Standards: 25.01, 25.02, 25.03, 25.04, 25.05, 25.06, 25.07, 25.08, 25.09]
- 26.0 Plan program design. [Student Performance Standards: 26.01, 26.02, 26.03, 26.04, 26.05 26.07]
- 27.0 Code programs. [Student Performance Standards: [27.01, 27.02, 27.03, 27.04, 27.05, 27.07, 27.08, 27.09, 27.10]
- 28.0 Perform program maintenance. [Student Performance Standards: [28.01, 28.02, 28.03, 28.04, 28.05]
- 35.0 Implement enhanced program structures. [Student Performance Standards: [35.01, 35.02, 35.08, 35.09, 35.10, 35.11, 35.12, 35.14, 35.15, 35.16, 35.17, 35.18]

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

Program Title: Business Computer Programming  
Secondary Number: 8206500  
Postsecondary Number: B070320

OCCUPATIONAL COMPLETION POINT - DATA CODE A  
Information Technology Assistant - SOC Code 43-4000

Computing for College and Careers competencies:

**INFORMATION SYSTEMS**

01.00 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. (LA.B.1.4.3)
- 01.02 Describe and use current and emerging computer technology and software to perform personal and business related tasks. (LA.B.2.4.4)
- 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. (LA.B.2.4.4, LA.A.2.4.6)
- 01.05 Demonstrate basic computer file management skills. (LA.A.2.4.2, LA.B.2.4.4, LA.B.2.4.6)
- 01.06 Troubleshoot problems with computer hardware peripherals and other office equipment. (LA.D.2.4.4)
- 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**

02.00 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)

03.05 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.

03.06 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. (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)

#### **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, 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.

**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. (SS.B.1.4.5)
- 10.02 Apply appropriate strategies to manage and resolve conflicts in work situations. (LA.D.1.4.2, SS.B.1.4.5)
- 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**

13.0 PERFORM FUNCTIONS AND RESPONSIBILITIES TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

- 13.02 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.).

**NETWORK/SOFTWARE SUPPORT**

41.0 PERFORM E-MAIL ACTIVITIES-The student will be able to:

- 41.01 Describe e-mail capabilities and functions.
- 41.09 Use the Internet to perform e-mail activities.

42.0 DEMONSTRATE OPERATING SYSTEMS-The student will be able to:

- 42.01 Identify operating system file naming conventions.
- 42.10 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
- 42.12 Demonstrate a working knowledge of standard file formats.
- 42.14 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

## **INFORMATION TECHNOLOGY**

- 67.0 DEVELOP AN AWARENESS OF EMERGING TECHNOLOGIES-The student will be able to:
- 67.01 Compare and contrast various methods of evaluation for emerging technologies.
  - 67.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
  - 67.03 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:

## **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.
  - 01.06 Troubleshoot problems with computer hardware peripherals and other office equipment.
  - 01.07 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:
- 02.03 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
  - 02.62 Organize ideas and communicate oral and written messages appropriate for information technology environments.
  - 02.63 Collaborate with individuals and teams to complete tasks and solve information technology problems.
  - 02.64 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.
  - 02.65 Apply the writing process to the creation of appropriate documents following designated business formats.
  - 02.66 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:

03.03 Use database, spreadsheet, and presentation software, scheduling, and integrated software packages to enhance communication.

03.06 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:

05.03 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).

05.04 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:

06.03 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:

- 07.04 Analyze, interpret, compile, and demonstrate the ability to present/communicate data in understandable and measurable terms using common statistical procedures.
- 07.05 Use common standards of measurement including the metric system in solving work-related or business problems (e.g., length, weight, currency, time).
- 07.06 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:

- 08.02 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:

- 09.15 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.).
- 09.16 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.
- 09.17 Describe job requirements for the variety of occupations and professions within the global world of information technology.
- 09.18 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
- 09.19 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
- 09.20 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.

- 10.03 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.).

#### **WORK-BASED LEARNING**

- 20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES-The student will be able to:

- 20.44 Participate in work-based learning experiences in an information technology environment.
- 20.46 Discuss the use of technology in an information technology environment.

#### **NETWORK/SOFTWARE SUPPORT**

- 41.0 PERFORM E-MAIL ACTIVITIES-The student will be able to:

- 41.01 Describe e-mail capabilities and functions.
- 41.02 Identify components of an e-mail message.
- 41.03 Identify the components of an e-mail address.
- 41.04 Identify when to use different e-mail options.
- 41.05 Attach a file to an e-mail message.
- 41.06 Forward an e-mail message.
- 41.07 Use an address book.
- 41.08 Reply to an e-mail message.
- 41.09 Use the Internet to perform e-mail activities.
- 41.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
- 41.12 Identify when to include information from an original e-mail message in a response.
- 41.13 Identify common problems associated with widespread use of e-mail.

- 42.0 DEMONSTRATE knowledge of different OPERATING SYSTEMS-The student will be able to:

- 42.01 Identify operating system file naming conventions.
- 42.10 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
- 42.12 Demonstrate a working knowledge of standard file formats.
- 42.14 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

#### **WEB DESIGN**

- 55.0 DEMONSTRATE PROFICIENCY NAVIGATING THE INTERNET, INTRANET, AND THE WWW-The student will be able to:

- 55.01 Identify and describe Web terminology.
- 55.10 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
- 55.11 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).

- 55.14 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
  - 55.15 Trace the evolution of the Internet from its inception to the present and into the future.
  - 55.16 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
  - 55.17 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
  - 55.18 Identify effective Boolean search strategies.
- 56.0 DEMONSTRATE PROFICIENCY USING HTML COMMANDS-The student will be able to:
- 56.01 Identify elements of a Web page.
  - 56.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
  - 56.03 Define basic HTML terminology.
  - 56.04 Analyze HTML source code developed by others.
  - 56.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, and tables).
  - 56.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
  - 56.08 Edit and test HTML documents for accuracy and validity.
  - 56.17 Use basic functions of WYSIWYG editors.
  - 56.18 Use basic functions of HTML, DHTML, and XML editors and converters.
  - 56.19 Enhance web pages through the addition of images and graphics including animation.
- 57.0 DEMONSTRATE PROFICIENCY IN PAGE DESIGN APPLICABLE TO THE WWW-The student will be able to:
- 57.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
  - 57.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
  - 57.04 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD ROMs).
  - 57.05 Use image design software to create and edit images.
  - 57.25 Demonstrate proficiency in publishing to the Internet.
  - 57.26 Demonstrate proficiency in adding downloadable forms to web pages.
  - 57.28 Explain the need for web-based applications.
- 63.0 DEMONSTRATE PROFICIENCY USING SPECIALIZED WEB DESIGN SOFTWARE-The student will be able to:
- 63.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).
  - 63.02 Demonstrate use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

## INFORMATION TECHNOLOGY

64.0 DEVELOP AN AWARENESS OF THE INFORMATION TECHNOLOGY INDUSTRY-The student will be able to:

- 64.01 Explain how information technology impacts the operation and management of business and society.
- 64.04 Explain the emergence of e-commerce and e-government and the potential impact on business and society.
- 64.05 Explain the emergence of a paperless society.

65.0 DEVELOP AN AWARENESS OF MICROPROCESSORS AND DIGITAL COMPUTERS-The student will be able to:

- 65.01 Describe the evolution of the digital computer.
- 65.02 Explain the general architecture of a microcomputer system.
- 65.03 Explain the evolution of microprocessors.
- 65.04 Explain software hierarchy and its impact on microprocessors.
- 65.05 Explain the need for and use of peripherals.
- 65.06 Demonstrate proficiency using peripherals.
- 65.07 Identify the basic concepts of computer maintenance and upgrades.
- 65.08 Differentiate between diagnosing and troubleshooting.

66.0 DEVELOP AN AWARENESS OF PROGRAMMING LANGUAGES-The student will be able to:

- 66.01 Explain the history of programming languages.
- 66.02 Explain the need for and use of compilers.
- 66.03 Explain how compilers work.
- 66.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

67.0 DEVELOP AN AWARENESS OF EMERGING TECHNOLOGIES-The student will be able to:

- 67.01 COMPARE AND CONTRAST VARIOUS METHODS OF EVALUATION FOR EMERGING TECHNOLOGIES:
- 67.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
- 67.03 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.).

69.0 DEMONSTRATE AN UNDERSTANDING OF THE SEVEN LAYERS OF THE OPEN SYSTEMS INTERFACE (OSI) MODEL-The student will be able to:

- 69.04 Identify types of networks and how they work.
- 69.06 Identify the role of servers and clients on a network.
- 69.07 Identify benefits and risks of networked computing.
- 69.08 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
- 69.09 Identify Intranets, Extranets and how they relate to the Internet.
- 69.11 Demonstrate basic understanding of network administration.

- 69.01 Describe the evolution of OSI from its inception to the present and into the future.
- 69.02 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.

#### **SOFTWARE APPLICATIONS**

- 70.0 DEMONSTRATE PROFICIENCY USING COMMON SOFTWARE APPLICATIONS-The student will be able to:
  - 70.01 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.).
  - 70.02 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.).
- 71.0 DEMONSTRATE PROFICIENCY USING SPECIALIZED SOFTWARE APPLICATIONS-The student will be able to:
  - 71.01 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.).
  - 71.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
  - 71.06 Demonstrate the ability to incorporate digital sound.

#### **OCCUPATIONAL COMPLETION POINT - DATA CODE B COMPUTER PROGRAMMER ASSISTANT - SOC Code 15.1021**

Intended outcomes of OCP A must be completed previously or concurrently. The following competencies are to be mastered in a single language, as 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:
  - 08.06 Investigate specific job opportunities in single language computer programming in the local job market.
  - 08.07 Identify tasks performed by computer programming personnel.
  - 08.08 Identify alternative career paths for computer programmers.
  - 08.09 Investigate the need for additional training for computer programmers.

## **WORK-BASED LEARNING**

20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES-The student will be able to:

- 20.25 Participate in work-based learning experiences in a computer programming environment.
- 20.26 Discuss the use of technology in a computer programming environment.
- 20.27 Compare and contrast programming languages used in a computer programming environment.

## **BUSINESS COMPUTER PROGRAMMING**

23.0 IDENTIFY FUNCTIONS OF INFORMATION PROCESSING-The student will be able to:

- 23.01 Identify characteristics of high-level languages.
- 23.02 Identify characteristics of operating systems.
- 23.03 Identify characteristics of sequential, indexed-sequential, random, and direct files.
- 23.04 Identify characteristics of a network.
- 23.05 Identify needs for software development in business.
- 23.06 Identify causes of software development problems in business.
- 23.07 Identify most appropriate languages for solving business problems.
- 23.08 Describe the difference between a database management system and a file management system.
- 23.09 Manipulate data between numbering systems.
- 23.10 Identify how numeric and non-numeric data are represented in memory.
- 23.13 Distinguish among integer, fixed-point, and floating-point calculations.

24.0 IDENTIFY FUNCTIONS OF COMPUTERS-The student will be able to:

- 24.01 Identify computer hardware and software.
- 24.02 Identify generic data processing terminology.
- 24.03 Identify advanced data processing terminology.
- 24.04 Sequence and define the steps in the input, processing, output, and storage cycle.
- 24.05 Identify examples of emerging hardware technology.
- 24.06 Illustrate various configurations of hardware components.

25.0 TEST PROGRAMS-The student will be able to:

- 25.01 Develop a plan for testing programs.
- 25.03 Develop data for use in program testing.
- 25.04 Perform debugging activities.
- 25.05 Distinguish among the different types of program and design errors.
- 25.06 Evaluate program test results.
- 25.07 Execute programs and subroutines as they relate to the total application.
- 25.08 Use trace routines of compilers to assist in program debugging.
- 25.09 Compile and run programs.

- 26.0 PLAN PROGRAM DESIGN-The student will be able to:
- 26.01 Formulate a plan to determine program specifications individually or in groups.
  - 26.02 Use a graphical representation or pseudo code to represent the structure in a program or subroutine.
  - 26.03 Design programs to solve problems using problem-solving strategies.
  - 26.04 Prepare proper input/output layout specifications.
  - 26.05 Examine existing utility programs and subroutines for use with other programs.
  - 26.07 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.
- 27.0 CODE PROGRAMS-The student will be able to:
- 27.01 Utilize reference manuals.
  - 27.02 Write programs according to recognized programming standards.
  - 27.03 Write internal documentation statements as needed in the program source code.
  - 27.04 Code programs in high-level languages for business applications.
  - 27.05 Write code that accesses sequential, indexed sequential, random, and direct files.
  - 27.07 Code programs using logical statements (e.g., If-Then-Else, Do...While).
  - 27.08 Enter and modify source code using a program language editor.
  - 27.09 Code routines within programs that validate input data.
  - 27.10 Use the rounding function in calculations within programs.
- 28.0 PERFORM PROGRAM MAINTENANCE-The student will be able to:
- 28.01 Review requested modification of programs and establish a plan of action.
  - 28.02 Design needed modifications in conformance with established standards.
  - 28.03 Code, test, and debug modifications prior to updating production code.
  - 28.04 Update production programs and documentation with changes.
  - 28.05 Analyze output to identify and annotate errors or enhancements.
- 29.0 CREATE AND MAINTAIN DOCUMENTATION-The student will be able to:
- 29.01 Write documentation to assist operators and end-users.
  - 29.02 Follow established documentation standards.
  - 29.03 Update existing documentation to reflect program changes.
- 30.0 EVALUATE ASSIGNED BUSINESS COMPUTER PROGRAMMING TASKS-The student will be able to:
- 30.01 Estimate the time necessary to write a program.
- 31.0 DEVELOP AN UNDERSTANDING OF BASIC FINANCIAL BUSINESS CONCEPTS-The student will be able to:
- 31.01 Identify generic accounting terminology as it relates to information systems.

- 31.02 Identify ways in which transactions interact with various business systems.
- 32.0 UNDERSTAND THE INTEGRATED NATURE OF CORPORATE SYSTEMS-The student will be able to:
- 32.01 Analyze the flow of information throughout the various departments in a business.
- 32.02 Explain how programs written for one department affect other departments in the business.
- 33.0 DEMONSTRATE AN UNDERSTANDING OF OPERATING SYSTEMS, ENVIRONMENTS, AND PLATFORMS-The student will be able to:
- 33.01 Identify various types of operating systems/environments for different computer hardware platforms.
- 33.02 Assess and analyze the functions of different operating systems.
- 33.03 Distinguish between different types of computer hardware platforms.
- 34.0 DEVELOP AN AWARENESS OF SOFTWARE QUALITY ASSURANCE-The student will be able to:
- 34.01 Identify the legal and social consequences of errors in software.
- 34.03 Describe copyright and other laws that relate to software theft and misuse.
- 34.04 Describe software security measures to protect computer systems and data from unauthorized use and tampering (e.g., physical security, passwords, virus protection/prevention).
- 35.0 IMPLEMENT ENHANCED PROGRAM STRUCTURES-The student will be able to:
- 35.01 Write programs that incorporate multi-level subtotals and page breaks.
- 35.02 Write programs that include tables or arrays and routines for data entry and lookup.
- 35.03 Write routines to sort arrays.
- 35.04 Write programs that sort records in files.
- 35.05 Write programs to create and maintain a master file.
- 35.06 Write programs to process transactions.
- 35.08 Write programs that use iteration.
- 35.10 Write programs that read and write sequential files.
- 35.11 Write programs that read and write indexed-sequential files.
- 35.12 Write programs that read and write random files.
- 36.0 DEVELOP AN UNDERSTANDING OF PROGRAMMING TECHNIQUES AND CONCEPTS-The student will be able to:
- 36.01 Identify the basic constructs used in structured programming.
- 36.02 Distinguish between top-down and bottom-up design.
- 36.04 Distinguish between iteration and recursion.
- 36.06 Evaluate Boolean expressions.
- 36.07 Distinguish between interpreters and compilers.

**OCCUPATIONAL COMPLETION POINT - DATA CODE C**  
**JUNIOR PROGRAMMER - SOC Code 15.1021**

Intended outcomes of OCP A and OCP B must be completed previously or concurrently. The following competencies are to be mastered in a single language, as appropriate.

**WORK-BASED LEARNING**

20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES-The student will be able to:

- 20.25 Participate in work-based learning experiences in a computer programming environment.
- 20.27 Compare and contrast programming languages used in a computer programming environment.
- 20.28 Discuss the management/supervisory skills needed in a computer programming environment.

**BUSINESS COMPUTER PROGRAMMING**

23.0 IDENTIFY FUNCTIONS OF INFORMATION PROCESSING-The student will be able to:

- 23.11 Identify the advantages and disadvantages of blocking and buffering when accessing data on tape and disk storage.
- 23.12 Choose appropriate storage of numeric values to insure precision needed for calculations (e.g., integer, fixed-point, floating-point).

24.0 IDENTIFY FUNCTIONS OF COMPUTERS-The student will be able to:

- 24.07 Identify the advantages and disadvantages of virtual memory.

25.0 TEST PROGRAMS-The student will be able to:

- 25.02 Develop a plan for system integration testing.

26.0 PLAN PROGRAM DESIGN-The student will be able to:

- 26.06 Plan interfaces for systems integration.

27.0 CODE PROGRAMS-The student will be able to:

- 27.06 Access external files in a client/server environment.

28.0 PERFORM PROGRAM MAINTENANCE-The student will be able to:

- 28.06 Modify or create new programs for vendor supplied applications.
- 28.07 Use a computer system with current commercial-end application software to solve problems within an organizational environment.

30.0 EVALUATE ASSIGNED BUSINESS COMPUTER PROGRAMMING TASKS-The student will be able to:

- 30.02 Utilize and apply project and time management tools to control systems development.

- 30.03 Analyze computer resources necessary to run a program.
- 34.0 DEVELOP AN AWARENESS OF SOFTWARE QUALITY ASSURANCE-The student will be able to:
- 34.02 Evaluate performance, functionality, and validity of various software packages.
- 35.0 IMPLEMENT ENHANCED PROGRAM STRUCTURES-The student will be able to:
- 35.07 Write programs to import/export data from external sources.  
 35.09 Write routines that incorporate "help" text.  
 35.14 Write interactive programs.  
 35.15 Design screen layouts for use in interactive programs.
- 36.0 DEVELOP AN UNDERSTANDING OF PROGRAMMING TECHNIQUES AND CONCEPTS-The student will be able to:
- 36.03 Identify object-oriented concepts and provide examples of objects in an object-oriented language.  
 36.05 Describe development methodologies, programming and system languages, database technologies, and data communication.

**OCCUPATIONAL COMPLETION POINT - DATA CODE D  
 JUNIOR PROGRAMMER 2 - SOC Code 15.1021**

Intended outcomes of OCP A, OCP B, and OCP C must be completed previously. The following competencies are to be mastered in two or more languages, as appropriate.

**BUSINESS COMPUTER PROGRAMMING**

- 25.0 TEST PROGRAMS-The student will be able to:
- 25.01 Develop a plan for testing programs.  
 25.02 Develop a plan for system integration testing.  
 25.03 Develop data for use in program testing.  
 25.04 Perform debugging activities.  
 25.05 Distinguish among the different types of program and design errors.  
 25.06 Evaluate program test results.  
 25.07 Execute programs and subroutines as they relate to the total application.  
 25.08 Use trace routines of compilers to assist in program debugging.  
 25.09 Compile and run programs.
- 26.0 PLAN PROGRAM DESIGN-The student will be able to:
- 26.01 Formulate a plan to determine program specifications individually or in groups.  
 26.02 Use a graphical representation or pseudo code to represent the structure in a program or subroutine.  
 26.03 Design programs to solve problems using problem-solving strategies.  
 26.04 Prepare proper input/output layout specifications.  
 26.05 Examine existing utility programs and subroutines for use with other programs.

- 26.07 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.
- 27.0 CODE PROGRAMS-The student will be able to:
- 27.01 Utilize reference manuals.
  - 27.02 Write programs according to recognized programming standards.
  - 27.03 Write internal documentation statements as needed in the program source code.
  - 27.04 Code programs in high-level languages for business applications.
  - 27.05 Write code that accesses sequential, indexed sequential, random, and direct files.
  - 27.07 Code programs using logical statements (e.g., If-Then-Else, Do...While).
  - 27.08 Enter and modify source code using a program language editor.
  - 27.09 Code routines within programs that validate input data.
  - 27.10 Use the rounding function in calculations within programs.
- 28.0 PERFORM PROGRAM MAINTENANCE-The student will be able to:
- 28.01 Review requested modification of programs and establish a plan of action.
  - 28.02 Design needed modifications in conformance with established standards.
  - 28.03 Code, test, and debug modifications prior to updating production code.
  - 28.04 Update production programs and documentation with changes.
  - 28.05 Analyze output to identify and annotate errors or enhancements.
  - 28.06 Modify or create new programs for vendor supplied applications.
  - 28.07 Use a computer system with current commercial-end application software to solve problems within an organizational environment.
- 29.0 CREATE AND MAINTAIN DOCUMENTATION-The student will be able to:
- 29.01 Write documentation to assist operators and end-users.
  - 29.02 Follow established documentation standards.
  - 29.03 Update existing documentation to reflect program changes.
- 30.0 EVALUATE ASSIGNED BUSINESS COMPUTER PROGRAMMING TASKS-The student will be able to:
- 30.02 Utilize and apply project and time management tools to control systems development.
  - 30.03 Analyze computer resources necessary to run a program.
- 33.0 DEMONSTRATE AN UNDERSTANDING OF OPERATING SYSTEMS, ENVIRONMENTS, AND PLATFORMS-The student will be able to:
- 33.02 Assess and analyze the functions of different operating systems.
  - 33.04 Assess and analyze the program development and execution utilities of relevant operating systems.
- 34.0 DEVELOP AN AWARENESS OF SOFTWARE QUALITY ASSURANCE-The student will be able to:
- 34.02 Evaluate performance, functionality, and validity of various software packages.

- 35.0 IMPLEMENT ENHANCED PROGRAM STRUCTURES-The student will be able to:
- 35.01 Write programs that incorporate multi-level subtotals and page breaks.
  - 35.02 Write programs that include tables or arrays and routines for data entry and lookup.
  - 35.03 Write routines to sort arrays.
  - 35.04 Write programs that sort records in files.
  - 35.05 Write programs to create and maintain a master file.
  - 35.06 Write programs to process transactions.
  - 35.07 Write programs to import/export/convert data from external sources.
  - 35.08 Write programs that use iteration.
  - 35.09 Write routines that incorporate "help" text.
  - 35.10 Write programs that read and write sequential files.
  - 35.11 Write programs that read and write indexed-sequential files.
  - 35.12 Write programs that read and write random files.
  - 35.14 Write interactive programs.
  - 35.15 Design screen layouts for use in interactive programs.
  - 35.16 Write programs using object-oriented languages.
- 36.0 DEVELOP AN UNDERSTANDING OF PROGRAMMING TECHNIQUES AND CONCEPTS-The student will be able to:
- 36.05 Describe development methodologies, programming and system languages, database technologies, and data communication.

**OCCUPATIONAL COMPLETION POINT - DATA CODE E  
COMPUTER PROGRAMMER - SOC Code 15.1021**

Intended outcomes of OCP A, OCP B, OCP C, and OCP D must be completed previously. The following competencies are to be mastered in two or more languages, as appropriate.

- 25.0 TEST PROGRAMS-The student will be able to:
- 25.01 Develop a plan for testing programs.
  - 25.02 Develop a plan for system integration testing.
  - 25.03 Develop data for use in program testing.
  - 25.04 Perform debugging activities.
  - 25.05 Distinguish among the different types of program and design errors.
  - 25.06 Evaluate program test results.
  - 25.07 Execute programs and subroutines as they relate to the total application.
  - 25.08 Use trace routines of compilers to assist in program debugging.
  - 25.09 Compile and run programs.
- 26.0 PLAN PROGRAM DESIGN-The student will be able to:
- 26.01 Formulate a plan to determine program specifications individually or in groups.
  - 26.02 Use a graphical representation or pseudo code to represent the structure in a program or subroutine.
  - 26.03 Design programs to solve problems using problem-solving strategies.

- 26.04 Prepare proper input/output layout specifications.
  - 26.05 Examine existing utility programs and subroutines for use with other programs.
  - 26.07 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.
- 27.0 CODE PROGRAMS-The student will be able to:
- 27.01 Utilize reference manuals.
  - 27.02 Write programs according to recognized programming standards.
  - 27.03 Write internal documentation statements as needed in the program source code.
  - 27.04 Code programs in high-level languages for business applications.
  - 27.05 Write code that accesses sequential, indexed sequential, random, and direct files.
  - 27.07 Code programs using logical statements (e.g., If-Then-Else, Do-While).
  - 27.08 Enter and modify source code using a program language editor.
  - 27.09 Code routines within programs that validate input data.
  - 27.10 Use the rounding function in calculations within programs.
- 28.0 PERFORM PROGRAM MAINTENANCE-The student will be able to:
- 28.01 Review requested modification of programs and establish a plan of action.
  - 28.02 Design needed modifications in conformance with established standards.
  - 28.03 Code, test, and debug modifications prior to updating production code.
  - 28.04 Update production programs and documentation with changes.
  - 28.05 Analyze output to identify and annotate errors or enhancements.
- 35.0 IMPLEMENT ENHANCED PROGRAM STRUCTURES-The student will be able to:
- 35.02 Write programs that include tables or arrays and routines for data entry and lookup.
  - 35.08 Write programs that use iteration.
  - 35.09 Write routines that incorporate "help" text.
  - 35.10 Write programs that read and write sequential files.
  - 35.11 Write programs that read and write indexed-sequential files.
  - 35.12 Write programs that read and write random files.
  - 35.14 Write interactive programs.
  - 35.15 Design screen layouts for use in interactive programs.
  - 35.16 Write programs using object-oriented languages.
  - 35.17 Write programs that include data structures (e.g., stacks, queues, trees, linked lists).
  - 35.18 Write programs that are event-driven.

**Florida Department of Education  
STUDENT PERFORMANCE STANDARDS**

**Secondary Course Number:** 8209020  
**Course Title:** Computing for College and Careers  
**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. After successful completion of this core course, students will have met Occupational Completion Point - Data Code A, Information Technology Assistant SOC Code 43- 4000

**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.

- 02.04 Prepare and deliver an oral report with appropriate materials to the class
  - 02.05 Participate in large group discussions as a member and/or a leader.
  - 02.06 Take notes, organize, summarize, and paraphrase ideas and details.
  - 02.07 Accurately follow written and oral instructions.
  - 02.08 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.
  - 03.05 Use computer networks (e.g., Internet, on-line databases, e-mail) to facilitate collaborative or individual learning and communication.
  - 03.06 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, 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**

##### 13.0 PERFORM FUNCTIONS AND RESPONSIBILITIES TO ACCOMPLISH JOB OBJECTIVES AND ENHANCE WORKPLACE PERFORMANCE-The student will be able to:

- 13.02 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.).

#### **NETWORK/SOFTWARE SUPPORT**

##### 41.0 PERFORM E-MAIL ACTIVITIES-The student will be able to:

- 41.01 Describe e-mail capabilities and functions.
- 41.09 Use the Internet to perform e-mail activities.

##### 42.0 DEMONSTRATE OPERATING SYSTEMS-The student will be able to:

- 42.01 Identify operating system file naming conventions.
- 42.10 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
- 42.12 Demonstrate a working knowledge of standard file formats.
- 42.14 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

## INFORMATION TECHNOLOGY

67.0 DEVELOP AN AWARENESS OF EMERGING TECHNOLOGIES-The student will be able to:

- 67.01 Compare and contrast various methods of evaluation for emerging technologies.
- 67.02 Demonstrate knowledge of the process of planning upgrades and changeovers.
- 67.03 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 Number:** 8207310  
**Course Title:** Introduction to Information Technology  
**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 web commands and design; and emerging technologies. After successful completion of Introduction to Information Technology, students will have met Occupational Completion Point - Data Code A, General Office - SOC Code 43-9061.

**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.
- 01.07 Describe ethical issues and problems associated with computers and information systems.

**WORKPLACE COMMUNICATIONS**

02.0 USE TECHNOLOGY TO APPLY AND ENHANCE COMMUNICATION SKILLS IN TECHNICAL READING, WRITING, SPEAKING, LISTENING, AND VIEWING-The student will be able to:

- 02.03 Use listening, speaking, telecommunication and nonverbal skills and strategies to communicate effectively with supervisors, co-workers, and customers.
- 02.62 Organize ideas and communicate oral and written messages appropriate for information technology environments.
- 02.63 Collaborate with individuals and teams to complete tasks and solve information technology problems.
- 02.64 Identify, define, and discuss professional information technology terminology appropriate for internal and external communications in an information technology environment.

- 02.65 Apply the writing process to the creation of appropriate documents following designated business formats.
  - 02.66 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:
- 03.03 Use database, spreadsheet, presentation software, scheduling, and integrated software packages to enhance communication.
  - 03.06 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. 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.
  - 04.02 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:
- 06.03 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:

- 08.02 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:

- 09.15 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.).
- 09.16 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.
- 09.17 Describe job requirements for the variety of occupations and professions within the global world of information technology.
- 09.18 Analyze personal skills and aptitudes in comparison with information technology career opportunities.
- 09.19 Refine and implement a plan to facilitate personal growth and skill development related to information technology career opportunities.
- 09.20 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.
- 10.03 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.).

**WORK-BASED LEARNING**

20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES-The student will be able to:

- 20.44 Participate in work-based learning experiences in an information technology environment.
- 20.46 Discuss the use of technology in an information technology environment.

**NETWORK/SOFTWARE SUPPORT**

41.0 PERFORM E-MAIL ACTIVITIES-The student will be able to:

- 41.01 Describe e-mail capabilities and functions.
- 41.02 Identify components of an e-mail message.
- 41.03 Identify the components of an e-mail address.
- 41.04 Identify when to use different e-mail options.
- 41.05 Attach a file to an e-mail message.
- 41.06 Forward an e-mail message.
- 41.07 Use an address book.
- 41.08 Reply to an e-mail message.
- 41.09 Use the Internet to perform e-mail activities.
- 41.10 Identify the appropriate use of e-mail and demonstrate related e-mail etiquette.
- 41.12 Identify when to include information from an original e-mail message in a response.
- 41.13 Identify common problems associated with widespread use of e-mail.

42.0 DEMONSTRATE KNOWLEDGE OF DIFFERENT OPERATING SYSTEMS-The student will be able to:

- 42.01 Identify operating system file naming conventions.
- 42.10 Demonstrate proficiency with file management and structure (e.g., folder creation, file creation, backup, copy, delete, open, save).
- 42.12 Demonstrate a working knowledge of standard file formats.
- 42.14 Explain the history and purpose of various operating systems (e.g., DOS, Windows, Mac, and Unix/Linux).

## WEB DESIGN

- 55.0 DEMONSTRATE PROFICIENCY NAVIGATING THE INTERNET, INTRANET, AND THE WWW—The student will be able to:
- 55.01 Identify and describe Web terminology.
  - 55.10 Demonstrate proficiency in using the basic features of GUI browsers (e.g., setting bookmarks, basic configurations, e-mail configurations, address book).
  - 55.11 Define Universal Resource Locators (URLs) and associated protocols (e.g., .com, .org, .edu, .gov, .net, .mil).
  - 55.14 Describe and observe Internet/Intranet ethics and copyright laws and regulatory control.
  - 55.15 Trace the evolution of the Internet from its inception to the present and into the future.
  - 55.16 Demonstrate proficiency using search engines (e.g., Yahoo!, Google, Northern Light, Lycos, Excite, etc.).
  - 55.17 Demonstrate proficiency using various web tools (e.g., downloading of files, transfer of files, telnet, PDF, etc.).
  - 55.18 Identify effective Boolean search strategies.
- 56.0 DEMONSTRATE PROFICIENCY USING HTML COMMANDS—The student will be able to:
- 56.01 Identify elements of a Web page.
  - 56.02 Describe individual Web page layouts and content (e.g., writing for the Web, Web structure).
  - 56.03 Define basic HTML terminology.
  - 56.04 Analyze HTML source code developed by others.
  - 56.05 Create Web pages using basic HTML tags (e.g., links, lists, character styles, text alignment, and tables).
  - 56.06 Use storyboarding techniques for subsequent Web pages (e.g., linear, hierarchical).
  - 56.08 Edit and test HTML documents for accuracy and validity.
  - 56.17 Use basic functions of WYSIWYG editors.
  - 56.18 Use basic functions of HTML, DHTML, and XML editors and converters.
  - 56.19 Enhance web pages through the addition of images and graphics including animation.
- 57.0 DEMONSTRATE PROFICIENCY IN PAGE DESIGN APPLICABLE TO THE WWW—The student will be able to:
- 57.01 Develop an awareness of acceptable Web page design, including index pages in relation to the rest of the Web site.
  - 57.02 Describe and apply color theory as it applies to Web page design (e.g., background and text color).
  - 57.04 Access and digitize graphics through various resources (e.g., scanner, digital cameras, on-line graphics, clipart, CD ROMs).
  - 57.05 Use image design software to create and edit images.
  - 57.25 Demonstrate proficiency in publishing to the Internet.
  - 57.26 Demonstrate proficiency in adding downloadable forms to web pages.
  - 57.xx Explain the need for web-based applications.

63.0 DEMONSTRATE PROFICIENCY USING SPECIALIZED WEB DESIGN SOFTWARE-The student will be able to:

63.01 Compare and contrast various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

63.02 Demonstrate use of various specialized web design software (e.g., Flash, Shockwave, GoLive, Director, etc.).

#### **INFORMATION TECHNOLOGY**

64.0 DEVELOP AN AWARENESS OF THE INFORMATION TECHNOLOGY INDUSTRY-The student will be able to:

64.01 Explain how information technology impacts the operation and management of business and society.

64.04 Explain the emergence of e-commerce and e-government and the potential impact on business and society.

64.05 Explain the emergence of a paperless society.

65.0 DEVELOP AN AWARENESS OF MICROPROCESSORS AND DIGITAL COMPUTERS-The student will be able to:

65.01 Describe the evolution of the digital computer.

65.02 Explain the general architecture of a microcomputer system.

65.03 Explain the evolution of microprocessors.

65.04 Explain software hierarchy and its impact on microprocessors.

65.05 Explain the need for and use of peripherals.

65.06 Demonstrate proficiency using peripherals.

65.07 Identify the basic concepts of computer maintenance and upgrades.

65.08 Differentiate between diagnosing and troubleshooting.

66.0 DEVELOP AN AWARENESS OF PROGRAMMING LANGUAGES-The student will be able to:

66.01 Explain the history of programming languages.

66.02 Explain the need for and use of compilers.

66.03 Explain how compilers work.

66.04 Identify the three types of programming design approaches (e.g., top-down, structured, and object-oriented).

67.0 DEVELOP AN AWARENESS OF EMERGING TECHNOLOGIES-The student will be able to:

67.01 Compare and contrast various methods of evaluation for emerging technologies.

67.02 Demonstrate knowledge of the process of planning upgrades and changeovers.

67.03 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.).

69.0 DEMONSTRATE AN UNDERSTANDING OF THE SEVEN LAYERS OF THE OPEN SYSTEMS INTERFACE (OSI) MODEL-The student will be able to:

- 69.01 Describe the evolution of OSI from its inception to the present and into the future.
- 69.02 Explain the interrelations of the seven layers of the Open Systems Interface (OSI) as it relates to hardware and software.
- 69.04 Identify types of networks and how they work.
- 69.06 Identify the role of servers and clients on a network.
- 69.07 Identify benefits and risks of networked computing.
- 69.08 Identify the relationship between computer networks and other communications networks (i.e. telephone systems).
- 69.09 Identify Intranets, Extranets and how they relate to the Internet.
- 69.11 Demonstrate basic understanding of network administration.

**SOFTWARE APPLICATIONS**

70.0 DEMONSTRATE PROFICIENCY USING COMMON SOFTWARE APPLICATIONS-The student will be able to:

- 70.01 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.).
- 70.02 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.).

71.0 DEMONSTRATE PROFICIENCY USING SPECIALIZED SOFTWARE APPLICATIONS-The student will be able to:

- 71.01 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.).
- 71.02 Demonstrate awareness of specialized software applications (e.g., OLTP, Computer Aided Design, Computer Aided Manufacturing, 3D animation, process control, materials management, etc.)
- 71.06 Demonstrate the ability to incorporate digital sound.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

**Secondary Course Number:** 8206010  
**Course Title:** Business Computer Programming 1  
**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 - Data Code B, Computer Programmer Assistant - **SOC Code 15.1021**.

**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:

- 08.06 Investigate specific job opportunities in computer programming in the local job market.
- 08.07 Identify tasks performed by computer programming personnel.
- 08.08 Identify alternative career paths for computer programmers.
- 08.09 Investigate the need for additional training for computer programmers.

**WORK-BASED LEARNING**

20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES-The student will be able to:

- 20.25 Participate in work-based learning experiences in a computer programming environment.
- 20.26 Discuss the use of technology in a computer programming environment.

**BUSINESS COMPUTER PROGRAMMING**

23.0 IDENTIFY FUNCTIONS OF INFORMATION PROCESSING-The student will be able to:

- 23.01 Identify characteristics of high-level languages.
- 23.02 Identify characteristics of operating systems.
- 23.03 Identify characteristics of sequential, indexed-sequential, random, and direct files.
- 23.04 Identify characteristics of a network.
- 23.05 Identify needs for software development in business.
- 23.13 Distinguish among integer, fixed-point, and floating-point calculations.

- 24.0 IDENTIFY FUNCTIONS OF COMPUTERS-The student will be able to:
- 24.01 Identify computer hardware and software.
  - 24.02 Identify generic data processing terminology.
  - 24.04 Sequence and define the steps in the input, processing, output, and storage cycle.
- 25.0 TEST PROGRAMS-The student will be able to:
- 25.01 Develop a plan for testing programs.
  - 25.03 Develop data for use in program testing.
  - 25.04 Perform debugging activities.
  - 25.05 Distinguish among the different types of program and design errors.
  - 25.06 Evaluate program test results.
  - 25.07 Execute programs and subroutines as they relate to the total application.
  - 25.09 Compile and run programs.
- 26.0 PLAN PROGRAM DESIGN-The student will be able to:
- 26.01 Formulate a plan to determine program specifications individually and in groups.
  - 26.02 Use a graphical representation or pseudocode to represent the structure in a program or subroutine.
  - 26.03 Design programs to solve problems using problem-solving strategies.
  - 26.04 Prepare proper input/output layout specifications.
  - 26.07 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.
- 27.0 CODE PROGRAMS-The student will be able to:
- 27.01 Utilize reference manuals.
  - 27.02 Write programs according to the recognized programming standards.
  - 27.03 Write internal documentation statements as needed in the program source code.
  - 27.04 Code programs in high-level languages for business applications.
  - 27.07 Code programs using logical statement (e.g., If-Then-Else, Do...While).
  - 27.08 Enter and modify source code using a program language editor.
  - 27.09 Code routines within programs that validate input data.
  - 27.10 Use the rounding function in calculations within programs.
- 28.0 PERFORM PROGRAM MAINTENANCE-The student will be able to:
- 28.05 Analyze output to identify and annotate errors or enhancements.
- 29.0 CREATE AND MAINTAIN DOCUMENTATION-The student will be able to:
- 29.02 Follow established documentation standards.
- 31.0 DEVELOP AN UNDERSTANDING OF BASIC FINANCIAL BUSINESS CONCEPTS-The student will be able to:
- 31.01 Identify generic accounting terminology as it relates to information systems.

- 31.02 Identify ways in which transactions interact with various business systems.
- 33.0 DEMONSTRATE AN UNDERSTANDING OF OPERATING SYSTEMS, ENVIRONMENTS, AND PLATFORMS-The student will be able to:
  - 33.01 Identify various types of operating systems/environments for different computer hardware platforms.
  - 33.03 Distinguish between different types of computer hardware platforms.
- 34.0 DEVELOP AN AWARENESS OF SOFTWARE QUALITY ASSURANCE-The student will be able to:
  - 34.01 Identify the legal and social consequences of errors in software.
  - 34.03 Describe copyright and other laws that relate to software theft and misuse.
  - 34.04 Describe software security measures to protect computer systems and data from unauthorized use and tampering (e.g., physical security, passwords, virus protection/prevention).
- 35.0 IMPLEMENT ENHANCED PROGRAM STRUCTURES-The student will be able to:
  - 35.01 Write programs that incorporate multi-level subtotals and page breaks.
  - 35.02 Write programs that include tables or arrays or routines for data entry and lookup.
  - 35.08 Write programs that use iteration.
- 36.0 DEVELOP AN UNDERSTANDING OF PROGRAMMING TECHNIQUES AND CONCEPTS-The student will be able to:
  - 36.01 Identify the basic constructs used in structured programming.
  - 36.02 Distinguish between top-down and bottom-up design.
  - 36.07 Distinguish between interpreters and compilers.

**Florida Department of Education  
STUDENT PERFORMANCE STANDARDS**

**Secondary Course Number:** 8206020  
**Course Title:** Business Computer Programming 2  
**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 - Data Code B, Computer Programmer Assistant - SOC **Code 15.1021**.

**WORK-BASED LEARNING**

20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES-The student will be able to:

- 20.25 Participate in work-based learning experiences in a computer programming environment.
- 20.26 Discuss the use of technology in a computer programming environment.
- 20.27 Compare and contrast programming languages used in a computer programming environment.

**BUSINESS COMPUTER PROGRAMMING**

23.0 IDENTIFY FUNCTIONS OF INFORMATION PROCESSING-The student will be able to:

- 23.06 Identify causes of software development problems in business.
- 23.07 Identify most appropriate languages for solving business problems.
- 23.08 Describe the difference between a database management system and a file management system.
- 23.09 Manipulate data between numbering systems.
- 23.10 Identify how numeric and non-numeric data are represented in memory.

24.0 IDENTIFY FUNCTIONS OF COMPUTERS-The student will be able to:

- 24.03 Identify advanced data processing terminology.
- 24.05 Identify examples of emerging hardware technology.
- 24.06 Illustrate various configurations of hardware components.

25.0 TEST PROGRAMS-The student will be able to:

- 25.08 Use trace routines of compilers to assist in program debugging.

- 26.0 PLAN PROGRAM DESIGN-The student will be able to:
  - 26.05 Examine existing utility programs and subroutines for use with other programs.
- 27.0 CODE PROGRAMS-The student will be able to:
  - 27.05 Write code that accesses sequential, indexed sequential, random, and direct files.
- 28.0 PERFORM PROGRAM MAINTENANCE-The student will be able to:
  - 28.01 Review requested modification of programs and establish a plan of action.
  - 28.02 Design needed modifications in conformance with established standards.
  - 28.03 Code, test, and debug modifications prior to updating production code.
  - 28.04 Update production programs and documentation with changes.
- 29.0 CREATE AND MAINTAIN DOCUMENTATION-The student will be able to:
  - 29.01 Write documentation to assist operators and end-users.
  - 29.03 Update existing documentation to reflect program changes.
- 30.0 EVALUATE ASSIGNED BUSINESS COMPUTER PROGRAMMING TASKS-The student will be able to:
  - 30.01 Estimate the time necessary to write a program.
- 32.0 UNDERSTAND THE INTEGRATED NATURE OF CORPORATE SYSTEMS-The student will be able to:
  - 32.01 Analyze the flow of information throughout the various departments in a business.
  - 32.02 Explain how programs written for one department affect other departments in the business.
- 33.0 DEMONSTRATE AN UNDERSTANDING OF OPERATING SYSTEMS, ENVIRONMENTS, AND PLATFORMS-The student will be able to:
  - 33.02 Assess and analyze the functions of different operating systems.
- 35.0 IMPLEMENT ENHANCED PROGRAM STRUCTURES-The student will be able to:
  - 35.03 Write routines to sort arrays.
  - 35.04 Write programs that sort records in files.
  - 35.05 Write programs to create and maintain a master file.
  - 35.06 Write programs to process transactions.
  - 35.10 Write programs that read and write sequential files.
  - 35.11 Write programs that read and write indexed-sequential files.
  - 35.12 Write programs that read and write random files.

36.0 DEVELOP AN UNDERSTANDING OF PROGRAMMING TECHNIQUES AND CONCEPTS-The student will be able to:

36.04 Distinguish between iteration and recursion.

36.06 Evaluate Boolean expressions.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

**Secondary Course Number:** 8206030  
**Course Title:** Business Computer Programming 3  
**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 - Data Code C, Junior Programmer - SOC **Code 15.1021.**

**WORK-BASED LEARNING**

20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES-The student will be able to:

20.25 Participate in work-based learning experiences in a computer programming environment.

20.27 Compare and contrast programming languages used in a computer programming environment.

**BUSINESS COMPUTER PROGRAMMING**

23.0 IDENTIFY FUNCTIONS OF INFORMATION PROCESSING-The student will be able to:

23.12 Choose appropriate storage of numeric values to insure precision needed for calculations (e.g., integer, fixed-point, floating-point).

24.0 IDENTIFY FUNCTIONS OF COMPUTERS-The student will be able to:

24.07 Identify the advantages and disadvantages of virtual memory.

25.0 TEST PROGRAMS-The student will be able to:

25.02 Develop a plan for system integration testing.

26.0 PLAN PROGRAM DESIGN-The student will be able to:

26.06 Plan interface for systems integration.

30.0 EVALUATE ASSIGNED BUSINESS COMPUTER PROGRAMMING TASKS-The student will be able to:

30.03 Analyze computer resources necessary to run a program.

- 34.0 DEVELOP AN AWARENESS OF SOFTWARE QUALITY ASSURANCE-The student will be able to:
- 34.02 Evaluate performance, functionality, and validity of various software packages.
- 35.0 IMPLEMENT ENHANCED PROGRAM STRUCTURES-The student will be able to:
- 35.07 Write programs to import/export data from external sources.
- 36.0 DEVELOP AN UNDERSTANDING OF PROGRAMMING TECHNIQUES AND CONCEPTS-The student will be able to:
- 36.03 Identify object-oriented concepts and provide examples of objects in an object-oriented language.
  - 36.05 Describe development methodologies, programming and system languages, database technologies, and data communication.

**Florida Department of Education  
STUDENT PERFORMANCE STANDARDS**

**Secondary Course Number:** 8206040  
**Course Title:** Business Computer Programming 4  
**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 - Data Code C, Junior Programmer - SOC **Code 15.1021**.

**WORK-BASED LEARNING**

20.0 PARTICIPATE IN WORK-BASED LEARNING EXPERIENCES-The student will be able to:

- 20.25 Participate in work-based learning experiences in a computer programming environment.
- 20.27 Compare and contrast programming languages used in a computer programming environment.
- 20.28 Discuss the management/supervisory skills needed in a computer programming environment.

**BUSINESS COMPUTER PROGRAMMING**

23.0 IDENTIFY FUNCTIONS OF INFORMATION PROCESSING-The student will be able to:

- 23.11 Identify the advantages and disadvantages of blocking and buffering when accessing data on tape and disk storage.

27.0 CODE PROGRAMS-The student will be able to:

- 27.06 Access external files in a client/server environment.

28.0 PERFORM PROGRAM MAINTENANCE-The student will be able to:

- 28.06 Modify or create new programs for vendor supplied applications.
- 28.07 Use a computer system with current commercial-end application software to solve problems within an organizational environment.

30.0 EVALUATE ASSIGNED BUSINESS COMPUTER PROGRAMMING TASKS-The student will be able to:

- 30.02 Utilize and apply project and time management tools to control systems development.

35.0 IMPLEMENT ENHANCED PROGRAM STRUCTURES-The student will be able to:

- 35.09 Write routines that incorporate "help" text.
- 35.14 Write interactive programs.
- 35.15 Design screen layouts for use in interactive programs.

**Florida Department of Education  
STUDENT PERFORMANCE STANDARDS**

**Secondary Course Number:** 8206050  
**Course Title:** Business Computer Programming 5  
**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 5 and 6, students will have met Occupational Completion Point - Data Code D, Junior Programmer 2 **SOC Code 15.1021**.

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.

**BUSINESS COMPUTER PROGRAMMING**

25.0 TEST PROGRAMS-The student will be able to:

- 25.01 Develop a plan for testing programs.
- 25.03 Develop data for use in program testing.
- 25.04 Perform debugging activities.
- 25.05 Distinguish among the different types of program and design errors.
- 25.06 Evaluate program test results.
- 25.07 Execute programs and subroutines as they relate to the total application.
- 25.08 Use trace routines of compilers to assist in program debugging.
- 25.09 Compile and run programs.

26.0 PLAN PROGRAM DESIGN-The student will be able to:

- 26.01 Formulate a plan to determine program specifications individually or in groups.
- 26.02 Use a graphical representation or pseudocode to represent the structure in a program or subroutine.
- 26.03 Design programs to solve problems using problem-solving strategies.
- 26.04 Prepare proper input/output layout specifications.
- 26.05 Examine existing utility programs and subroutines for use with other programs.
- 26.07 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.

27.0 CODE PROGRAMS-The student will be able to:

- 27.01 Utilize reference manuals.
- 27.02 Write programs according to recognized programming standards.
- 27.03 Write internal documentation statements as needed in the program source code.

- 27.04 Code programs in high-level languages for business applications.
  - 27.05 Write code that accesses sequential, indexed sequential, random, and direct files.
  - 27.07 Code programs using logical statements (e.g., If-Then-Else, Do...While).
  - 27.08 Enter and modify source code using a program language editor.
  - 27.09 Code routines within programs that validate input data.
  - 27.10 Use the rounding function in calculations within programs.
- 28.0 PERFORM PROGRAM MAINTENANCE-The student will be able to:
- 28.01 Review requested modification of programs and establish a plan of action.
  - 28.02 Design needed modifications in conformance with established standards.
  - 28.03 Code, test, and debug modifications prior to updating production code.
  - 28.04 Update production programs and documentation with changes.
  - 28.05 Analyze output to identify and annotate errors or enhancements.
- 29.0 CREATE AND MAINTAIN DOCUMENTATION-The student will be able to:
- 29.01 Write documentation to assist operators and end-users.
  - 29.02 Follow established documentation standards.
  - 29.03 Update existing documentation to reflect program changes.
- 30.0 EVALUATE ASSIGNED BUSINESS COMPUTER PROGRAMMING TASKS-The student will be able to:
- 30.02 Utilize and apply project and time management tools to control systems development.
- 35.0 IMPLEMENT ENHANCED PROGRAM STRUCTURES-The student will be able to:
- 35.01 Write programs that incorporate multi-level subtotals and page breaks.
  - 35.02 Write programs that include tables or arrays and routines for data entry and lookup.
  - 35.03 Write routines to sort arrays.
  - 35.04 Write programs that sort records in files.
  - 35.05 Write programs to create and maintain a master file.
  - 35.06 Write programs to process transactions.
  - 35.08 Write programs that use iteration.
  - 35.10 Write programs that read and write sequential files.
  - 35.11 Write programs that read and write indexed-sequential files.
  - 35.12 Write programs that read and write random files.

**Florida Department of Education  
STUDENT PERFORMANCE STANDARDS**

**Secondary Course Number:** 8206060  
**Course Title:** Business Computer Programming 6  
**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 5 and 6, students will have met Occupational Completion Point - Data Code D, Junior Programmer 2 SOC **Code 15.1021**.

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.

**BUSINESS COMPUTER PROGRAMMING**

25.0 TEST PROGRAMS-The student will be able to:

25.02 Develop a plan for system integration testing.

28.0 PERFORM PROGRAM MAINTENANCE-The student will be able to:

28.06 Modify or create new programs for vendor supplied applications.

28.07 Use a computer system with current commercial-end application software to solve problems within an organizational environment.

30.0 EVALUATE ASSIGNED BUSINESS COMPUTER PROGRAMMING TASKS-The student will be able to:

30.02 Utilize and apply project and time management tools to control systems development.

30.03 Analyze computer resources necessary to run a program.

33.0 DEMONSTRATE AN UNDERSTANDING OF OPERATING SYSTEMS, ENVIRONMENTS, AND PLATFORMS-The student will be able to:

33.02 Assess and analyze the functions of different operating systems.

33.03 Assess and analyze the program development and execution utilities of relevant operating systems.

34.0 DEVELOP AN AWARENESS OF SOFTWARE QUALITY ASSURANCE-The student will be able to:

34.02 Evaluate performance, functionality, and validity of various software packages.

35.0 IMPLEMENT ENHANCED PROGRAM STRUCTURES-The student will be able to:

35.07 Write programs to import/export/convert data from external sources.

35.09 Write routines that incorporate "help" text.

35.14 Write interactive programs.

35.15 Design screen layouts for use in interactive programs.

35.16 Write programs using object-oriented languages.

36.0 DEVELOP AN UNDERSTANDING OF PROGRAMMING TECHNIQUES AND CONCEPTS-The student will be able to:

36.05 Describe development methodologies, programming and system languages, database technologies, and data communication.

**Florida Department of Education  
STUDENT PERFORMANCE STANDARDS**

**Secondary Course Number:** 8206070  
**Course Title:** Business Computer Programming 7  
**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 7, students will have met Occupational Completion Point - Data Code E, Computer Programmer -SOC **Code 15.1021**.

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.

**BUSINESS COMPUTER PROGRAMMING**

25.0 TEST PROGRAMS-The student will be able to:

- 25.01 Develop a plan for testing programs.
- 25.02 Develop a plan for system integration testing.
- 25.03 Develop data for use in program testing.
- 25.04 Perform debugging activities.
- 25.05 Distinguish among the different types of program and design errors.
- 25.06 Evaluate program test results.
- 25.07 Execute programs and subroutines as they relate to the total application.
- 25.08 Use trace routines of compilers to assist in program debugging.
- 25.09 Compile and run programs.

26.0 PLAN PROGRAM DESIGN-The student will be able to:

- 26.01 Formulate a plan to determine program specifications individually or in groups.
- 26.02 Use a graphical representation or pseudocode to represent the structure in a program or subroutine.
- 26.03 Design programs to solve problems using problem-solving strategies.
- 26.04 Prepare proper input/output layout specifications.
- 26.05 Examine existing utility programs and subroutines for use with other programs.
- 26.07 Manually trace the execution of programs and verify that programs follow the logic of their design as documented.

27.0 CODE PROGRAMS-The student will be able to:

- 27.01 Utilize reference manuals.
- 27.02 Write programs according to recognized programming standards.
- 27.03 Write internal documentation statements as needed in the program

- source code.
  - 27.04 Code programs in high-level languages for business applications.
  - 27.05 Write code that accesses sequential, indexed sequential, random, and direct files.
  - 27.07 Code programs using logical statements (e.g., If-Then-Else, Do...While).
  - 27.08 Enter and modify source code using a program language editor.
  - 27.09 Code routines within programs that validate input data.
  - 27.10 Use the rounding function in calculations within programs.
- 28.0 PERFORM PROGRAM MAINTENANCE-The student will be able to:
- 28.01 Review requested modification of programs and establish a plan of action.
  - 28.02 Design needed modifications in conformance with established standards.
  - 28.03 Code, test, and debug modifications prior to updating production code.
  - 28.04 Update production programs and documentation with changes.
  - 28.05 Analyze output to identify and annotate errors or enhancements.
- 35.0 IMPLEMENT ENHANCED PROGRAM STRUCTURES-The student will be able to:
- 35.02 Write programs that include tables or arrays and routines for data entry and lookup.
  - 35.08 Write programs that use iteration.
  - 35.09 Write routines that incorporate "help" text.
  - 35.10 Write programs that read and write sequential files.
  - 35.11 Write programs that read and write indexed-sequential files.
  - 35.12 Write programs that read and write random files.
  - 35.14 Write interactive programs.
  - 35.15 Design screen layouts for use in interactive programs.
  - 35.16 Write programs using object-oriented languages.
  - 35.17 Write programs that include data structures (e.g., stacks, queues, trees, linked lists).
  - 35.18 Write programs that are event-driven.