

Florida Department of Education  
CURRICULUM FRAMEWORK

**Program Title:** Commercial Business Machine Maintenance  
**Occupational Area:** Industrial Education

	<u>Secondary</u>	<u>PSAV</u>
<b>Program Numbers</b>	<b>8716000</b>	<b>I470102</b>
CIP Number	0647.010200	0647.010200
Grade Level	9-12, 30, 31	30, 31
Length	11 Credits	1650 hours
SOC	49-2011	49-2011
Certification	BUS MACH @7 G	BUS MACH @7G
	COMP SVC @7 G	COMP SVC @7G
	ELECTRONIC @7G	ELECTRONIC @7G

I. **MAJOR CONCEPTS/CONTENT:** The purpose of this program is to prepare students for employment as office machine servicers (SOC 49-2011)

The content includes, but is not limited to, communication skills, leadership skills, human relations and employability skills, safe and efficient work practices, and the maintenance and repair of a variety of office machines as keyboards, data processing equipment, duplicating machines, and mailing machines.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the Business Machine Maintenance industry; planning, management, finance, technical and product skills, underlying principles of technology, labor issues, community issues and health, safety, and environmental issues.

II. **LABORATORY ACTIVITIES:** Shop or laboratory activities are an integral part of this program and provide instruction in diagnostic/ troubleshooting technique, use of test equipment, and applied mechanics, and electrical/electronic theory as they relate to the repair of business machines.

III. **SPECIAL NOTE:** SkillsUSA, Inc. is the appropriate Career and Technical Student Organization (CTSO) for providing leadership training and for reinforcing specific career and technical skills. Career and Technical 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 adult vocational students to complete this program are: Mathematics 10.0, Language 9.0, Reading 10.0. These grade-level numbers correspond to grade-equivalent scores obtained on one of the state-designated basic-skills examinations. If a student does not meet the basic-skills level required for completion of the program, remediation should be provided concurrently through Vocational Preparatory Instruction (VPI). Please refer to the Rule for exemptions.

When a secondary student with a disability is enrolled in a vocational class with modifications to the curriculum framework, the particular outcomes and student performance standards, which the student must master to earn credit, must be specified on an individual basis. The job or jobs for which the student is being trained should be reflected in the student's desired postschool outcome statement on the Transition Individual Educational Plan (Transition IEP).

***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.***

To be transferable statewide between institutions, this program/course 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.

When this program is offered at the postsecondary level it may be offered in courses. Vocational credit shall be awarded to the student on a transcript in accordance with Section 1001.44(3) (b), F.S.

Occupational Completion Points may be reached before the end of a secondary course. All outcomes must be completed to receive credit for an Occupational Completion Point (OCP).

Listed below are the courses that comprise this program when offered at the Secondary Level:

8716010	- Commercial Business Machine Maintenance	1 (150)
8716020	- Commercial Business Machine Maintenance	2 (150)
8716030	- Commercial Business Machine Maintenance	3 (150) [450]
<b>OCP A</b>		
8716040	- Commercial Business Machine Maintenance	4 (150) [150]
<b>OCP B</b>		
8716050	- Commercial Business Machine Maintenance	5 (150)
8716060	- Commercial Business Machine Maintenance	6 (150) [300]
<b>OCP C</b>		
8716070	- Commercial Business Machine Maintenance	7 (150)
8716080	- Commercial Business Machine Maintenance	8 (150) [300]
<b>OCP D</b>		

8716090 - Commercial Business Machine Maintenance 9 (150)  
8716100 - Commercial Business Machine Maintenance 10 (150) [225]

**OCP E**

8716110 - Commercial Business Machine Maintenance 11 (150) [225]

**OCP F**

SCANS Competencies: To accomplish the Secretary's Commission on Achieving Necessary Skills (SCANS) competencies, instructional strategies for this cluster 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 methods to improve students' personal qualities and higher-order thinking skills.

The standard length of this program is 1650 hours.

IV. **INTENDED OUTCOMES**: After successfully completing the program, the student will be able to:

**OCCUPATIONAL COMPLETION POINT - A** (450 Hours) (SOC 49-2011)  
END USER SUPPORT TECHNICIAN - LEVEL I SUPPORT TECHNICIAN  
HELP DESK SPECIALIST - INDUSTRY TITLE

- 01.0 Demonstrate proficiency in software fundamentals.
- 02.0 Demonstrate proficiency in customer relations.
- 03.0 Demonstrate appropriate communication skills.
- 04.0 Demonstrate employability skills.

**OCCUPATIONAL COMPLETION POINT - B** (150 Hours)  
PC ELECTRONICS INSTALLER - LEVEL II (SOC 49-2011)

- 05.0 Demonstrate proficiency in soldering and basic laboratory skills.
- 06.0 Demonstrate proficiency in basic D.C. circuits.
- 07.0 Demonstrate appropriate understanding of basic math.
- 08.0 Demonstrate appropriate understanding of basic science.
- 09.0 Demonstrate proficiency in basic A.C. circuits.

**OCCUPATIONAL COMPLETION POINT - C** (300 Hours)  
COMPUTER SUPPORT SPECIALIST - LEVEL I - LAN TECHNICIAN  
(SOC 49-2011)

- 10.0 Demonstrate proficiency in computer systems architecture.
- 11.0 Demonstrate proficiency in peripheral equipment.

**OCCUPATIONAL COMPLETION POINT - D** (300 Hours)  
FIELD SERVICE TECHNICIAN/P.C. TECHNICIAN - OES 25104 (SOC 49-2011)

- 12.0 Demonstrate proficiency in electronic information exchanges.
- 13.0 Demonstrate proficiency in site requirements and considerations.

**OCCUPATIONAL COMPLETION POINT - E** (225 Hours)  
COPIER/PRINTER INSTALLER (SOC 49-2011)

- 14.0 Demonstrate proficiency in installation of copier systems.
- 15.0 Demonstrate proficiency in installation of printing systems.
- 16.0 Demonstrate proficiency in minor preventive maintenance of printer systems.
- 17.0 Demonstrate proficiency in minor preventive maintenance of copier systems.

**OCCUPATIONAL COMPLETION POINT - F (225 Hours)**

**COPIER/PRINTER MAINTENANCE TECHNICIAN (SOC 49-2011)**

- 18.0 Demonstrate proficiency in diagnosis and repair of copier systems.
- 19.0 Demonstrate knowledge in the repair of Electro-Mechanical Systems.
- 20.0 Demonstrate proficiency in diagnosis and repair of printing systems.

The following diagram illustrates the program structure:

**COMMERCIAL BUSSINESS MACHINE MAINTENANCE**

OCP A  
SOFTWARE FUNDAMENTALS  
  
(450 Hours)

OCP B  
BASIC ELECTRONICS  
  
(150 Hours)

OCP C  
SYSTEMS HARDWARE  
  
(300 Hours)

OCP D  
SYSTEMS NETWORKING  
  
(300 Hours)

OCP E  
COPIER/PRINTER  
INSTALLATION  
  
(225 Hours)

OCP F  
COPIER/PRINTER REPAIR  
  
(225 Hours)

**Florida Department of Education  
STUDENT PERFORMANCE STANDARDS**

**Program Title:** Commercial Business Machine Maintenance  
**Secondary Number:** 8716000  
**Postsecondary Number:** I470102

**OCCUPATIONAL COMPLETION POINT - DATA CODE - A (450 Hours)**  
 END USER SUPPORT TECHNICIAN (SOC 49-2011)

01.0 DEMONSTRATE PROFICIENCY IN SOFTWARE FUNDAMENTALS--The student will be able to:

- 01.01 Apply OS commands, syntax usage and parameters.
- 01.02 Demonstrate knowledge of OS file storage, FAT tables, boot record and disk partition procedures.
- 01.03 Identify OS utilities for technical personnel.
- 01.04 Demonstrate proficiency in protecting stored data.
- 01.05 Demonstrate an understanding and implementation of virus protection.
- 01.06 Understand, control and customize OS drivers.
- 01.07 Understand compression technologies for the trouble shooting of related problems.
- 01.08 Understand and apply procedures for memory management and computer environment configuring.
- 01.09 Demonstrate proficiency in the boot up process.
- 01.10 Apply troubleshooting techniques for operating systems.
- 01.11 Describe the fundamentals of advanced graphical user interface (GUI) operating network systems.
- 01.12 Demonstrate usage of third party software diagnostic tools.

02.0 DEMONSTRATE PROFICIENCY IN CUSTOMER RELATIONS--The student will be able to:

- 02.01 Describe and demonstrate appropriate personal hygiene and professional attire.
- 02.02 Describe and demonstrate effective listening techniques.
- 02.03 Describe and apply techniques for instilling customer confidence and satisfaction.
- 02.04 Describe and apply techniques for keeping the customer informed.
- 02.05 Describe and apply effective follow-up techniques.
- 02.06 Demonstrate discretion in interacting with customers in field and retail environments.
- 02.07 Demonstrate an understanding of basic conflict resolution.

03.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS--The student will be able to:

- 03.01 Write logical and understandable statements, or phrases, to accurately fill out forms and invoices commonly used in business and industry.
- 03.02 Read and use graphs, charts, diagrams, tables, parts manuals, and information sources commonly used in this industry/occupational area.
- 03.03 Read and follow written and oral instructions.
- 03.04 Answer and ask questions coherently and concisely.

- 03.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
- 03.06 Demonstrate appropriate telephone/communication skills.
- 04.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:
  - 04.01 Prepare a resume.
  - 04.02 Conduct a job search.
  - 04.03 Secure information about a job.
  - 04.04 Identify and provide documents, which may be required when interviewing for a job.
  - 04.05 Complete a job application form correctly and completely.
  - 04.06 Demonstrate competence in job interview techniques.
  - 04.07 Identify and demonstrate appropriate responses to criticism from employer, supervisor or other employees.
  - 04.08 Identify and demonstrate acceptable work habits.
  - 04.09 Demonstrate knowledge of how to make job changes appropriately.
  - 04.10 Demonstrate knowledge of employee health issues.
  - 04.11 Demonstrate efficient organizational skills.
  - 04.12 Demonstrate knowledge of the "Right-To-Know Law" as recorded in (29 CFR-1910.1200).

**OCCUPATIONAL COMPLETION POINT - DATA CODE - B (150 Hours)**  
 PC ELECTRONICS INSTALLER - LEVEL II (SOC 49-2011)

- 05.0 DEMONSTRATE PROFICIENCY IN SOLDERING AND BASIC LABORATORY PRACTICES--The student will be able to:
  - 05.01 Apply proper Occupational Safety Health Administration (OSHA) safety standards.
  - 05.02 Make electrical connections.
  - 05.03 Identify and use hand tools properly.
  - 05.04 Identify and use power tools properly.
  - 05.05 Demonstrate acceptable soldering techniques.
  - 05.06 Demonstrate acceptable desoldering techniques.
  - 05.07 Demonstrate electrostatic discharge (ESD) safety procedures.
  - 05.08 Describe the construction of printed circuit boards (PCB's).
  - 05.09 Explain the theoretical concepts of soldering.
  - 05.10 Demonstrate rework and repair techniques.
- 06.0 DEMONSTRATE PROFICIENCY IN BASIC D.C. CIRCUITS--The student will be able to:
  - 06.01 Solve problems in electronic units utilizing metric prefixes.
  - 06.02 Identify sources of electricity.
  - 06.03 Define voltage, current, resistance, power and energy.
  - 06.04 Apply Ohm's law and power formulas.
  - 06.05 Read and interpret color codes and symbols to identify electrical components and values.
  - 06.06 Measure properties of a circuit using volt-ohm meter (VOM) and digital volt-ohm meter (DVM) and oscilloscopes.
  - 06.07 Compute conductance and compute and measure resistance of conductors and insulators.
  - 06.08 Apply Ohm's law to series circuits.
  - 06.09 Construct and verify operation of series circuits.
  - 06.10 Analyze and troubleshoot series circuits.
  - 06.11 Apply Ohm's law to parallel circuits.
  - 06.12 Construct and verify the operation of parallel circuits.

06.13 Analyze and troubleshoot parallel circuits.

07.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC MATH--The student will be able to:

- 07.01 Solve problems for volume, weight, area and circumference and perimeter measurements for rectangles, square and cylinders.
- 07.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, and feet and inches.
- 07.03 Add, subtract, multiply and divide using fractions, decimals and whole numbers.
- 07.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
- 07.05 Demonstrate an understanding of federal, state and local taxes and their computation.

08.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE--The student will be able to:

- 08.01 Demonstrate an understanding of the effects of temperature extremes and moisture content in regards to electronic equipment.
- 08.02 Demonstrate an understanding of the impact and effects of electrostatic discharge (ESD), power surges, grounding, and lightning strikes.
- 08.03 Apply the scientific method to draw conclusions or make inferences from data.
- 08.04 Demonstrate deductive reasoning techniques when troubleshooting.
- 08.05 Demonstrate an understanding of the effects of heat load and ventilation in regards to electronic equipment.
- 08.06 Identify safety and health related issues, including exposure to work related chemicals and hazardous materials, and demonstrate the appropriate precautionary measures.
- 08.07 Demonstrate an understanding of environmental impact and regulations in regards to the appropriate disposal of electronic equipment.

09.0 DEMONSTRATE PROFICIENCY IN BASIC A.C. CIRCUITS--The student will be able to:

- 09.01 Identify properties of an AC signal.
- 09.02 Identify AC sources.
- 09.03 Analyze and measure AC signals utilizing VOM, DVM,

**OCCUPATIONAL COMPLETION POINT - DATA CODE - C (300 Hours)**  
COMPUTER SUPPORT SPECIALIST - LEVEL I - LAN TECHNICIAN (SOC 49-2011)

10.0 DEMONSTRATE PROFICIENCY IN COMPUTER SYSTEMS ARCHITECTURE--The student will be able to:

- 10.01 Draw and explain systems configuration in block detail.
- 10.02 Perform personal computer system tear-down, cleaning and inspection.
- 10.03 Upgrade and troubleshoot a variety of motherboards.
- 10.04 Demonstrate knowledge of bus systems and processor architecture.
- 10.05 Understand and troubleshoot memory and cache systems.

- 10.06 Understand, troubleshoot and replace power supply systems.
  - 10.07 Troubleshoot a microcomputer system.
  - 10.08 Demonstrate system-upgrading techniques.
- 11.0 DEMONSTRATE PROFICIENCY IN PERIPHERAL EQUIPMENT--The student will be able to:
- 11.01 Demonstrate an understanding of input/output devices.
  - 11.02 Identify and define serial and parallel interface standards.
  - 11.03 Troubleshoot and replace video display hardware and monitors.
  - 11.04 Troubleshoot, install and upgrade telecommunications devices and adapter cards.
  - 11.05 Troubleshoot, install and upgrade multimedia hardware and software.
  - 11.06 Troubleshoot, install and upgrade hard drives and CD-ROMS.
  - 11.07 Troubleshoot and install tape and other mass data storage devices.
  - 11.08 Troubleshoot, install and maintain printers.
  - 11.09 Demonstrate professional connector assembly procedures.

**OCCUPATIONAL COMPLETION POINT - DATA CODE - D (300 Hours)**  
**FIELD SERVICE TECHNICIAN/P.C. TECHNICIAN (SOC 49-2011)**

- 12.0 DEMONSTRATE PROFICIENCY IN ELECTRONIC INFORMATION EXCHANGE--The student will be able to:
- 12.01 Install, connect and maintain network clients and peripherals to various network operating systems.
  - 12.02 Demonstrate use of file systems commands and utilities on a network server.
  - 12.03 Demonstrate setup configuring and sharing of user security, file, printer and network resources.
  - 12.04 Demonstrate setup configuring and troubleshooting network applications on the server.
  - 12.05 Demonstrate setup configuring and backup operation on the server or clients.
  - 12.06 Demonstrate proficiency in performing help desk support for a network computer system.
  - 12.07 Connect and configure computers for network connectivity.
  - 12.08 Perform basic network system maintenance.
  - 12.09 Describe use and system maintenance of a WAN and telecommunications system.
  - 12.10 Perform procedures related to administration of a secure network.
  - 12.11 Demonstrate knowledge of the Internet WAN system.
  - 12.12 Demonstrate knowledge of network protocols.
  - 12.13 Demonstrate knowledge of fundamentals of an internet system.
  - 12.14 Demonstrate knowledge of telecommunications services and standards.
  - 12.15 Un-install, configure and troubleshoot Internet/Internet access by using browsers.
- 13.0 DEMONSTRATE PROFICIENCY IN SITE REQUIREMENTS AND CONSIDERATIONS--The student will be able to:
- 13.01 Demonstrate knowledge of data communication test equipment.
  - 13.02 Demonstrate knowledge of telecommunication wiring systems.
  - 13.03 Demonstrate knowledge of cable and LAN topology.
  - 13.04 Demonstrate knowledge of hubs, switches and routers.

- 13.05 Calculate and determine power requirements.
- 13.06 Calculate and determine requirements of the working environment.
- 13.07 Install, configure and troubleshoot LAN cable systems (twisted pair, coax, or fiber).
- 13.08 Configure and troubleshoot patch bay, hubs and transceivers.

**OCCUPATIONAL COMPLETION POINT - DATA CODE - E (225 Hours)**  
 COPIER/PRINTER INSTALLER (SOC 49-2011)

14.0 DEMONSTRATE PROFICIENCY IN INSTALLATION OF COPIER SYSTEMS--The student will be able to:

- 14.01 Install and replace major office copier components.
- 14.02 Perform office copier systems checks.
- 14.03 Set up, and install office copier systems.
- 14.04 Perform cleaning and preventive maintenance on copiers.
- 14.05 Install copier related software.

15.0 DEMONSTRATE PROFICIENCY IN INSTALLATION OF PRINTER SYSTEMS--The student will be able to:

- 15.01 install and replace major office printer components.
- 15.02 Perform office printer systems checks.
- 15.03 Set up, and install office printing systems.
- 15.04 Install printer related software.

16.0 DEMONSTRATE PROFICIENCY IN MINOR PREVENTIVE MAINTENANCE OF PRINTER SYSTEMS--The student will be able to:

- 16.01 Perform cleaning and preventive maintenance on printers.
- 16.02 Perform basic trouble shooting of printer systems.

17.0 DEMONSTRATE PROFICIENCY IN MINOR PREVENTIVE MAINTENANCE OF COPIER SYSTEMS--The student will be able to:

- 17.01 Perform cleaning and preventive maintenance of copier systems.
- 17.02 Perform basic trouble shooting of copier systems.

**OCCUPATIONAL COMPLETION POINT - DATA CODE - F (225 Hours)**  
 COPIER/PRINTER MAINTENANCE TECHNICIAN (SOC 49-2011)

18.0 DEMONSTRATE PROFICIENCY IN DIAGNOSIS AND REPAIR OF COPIER SYSTEMS--The student will be able to:

- 18.01 Read and interpret schematics and block diagrams of office.
- 18.02 Determine the status of electro-mechanical copier devices.
- 18.03 Determine the status of copier power supply systems.
- 18.04 Remove and replace copier power supply.
- 18.05 Determine the status of copier control boards.
- 18.06 remove and replace defective copier control boards.
- 18.07 Determine the status of copier optical systems.
- 18.08 Remove and replace optical systems.
- 18.09 Calibrate optic and control systems.
- 18.10 Determine status of fuse systems.
- 18.11 Demonstrate proficiency in installation of copier systems.

19.0 DEMONSTRATE KNOWLEDGE IN DIAGNOSIS AND REPAIR OF ELECTRO MECHANICAL SYSTEMS--The student will be able to:

- 19.01 Repair paper feed systems.
  - 19.02 Demonstrate an understanding of copy transfer and fusing.
  - 19.03 Demonstrate understanding of electro static charging.
  - 19.04 Demonstrate an understanding of developing.
  - 19.05 Repair sorting systems.
  - 19.06 Construct electrical connections.
  - 19.07 Trouble shoot keyboards.
  - 19.08 Make minor adjustments to keyboards and printing carriers.
- 20.0 DEMONSTRATE PROFICIENCY IN REPAIR OF PRINTING SYSTEMS--The student will be able to:
- 20.01 Read and interpret schematics and block diagrams of printing systems.
  - 20.02 Determine the status of electro mechanical printer devices.
  - 20.03 Determine the status of printer power supply systems.
  - 20.04 Remove and replace printer power supply.
  - 20.05 Determine the status of printer control boards.
  - 20.06 Remove and replace defective printer control boards.
  - 20.07 Determine the status of fuse systems.
  - 20.08 Demonstrate proficiency in initialization of printer systems.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

**Course Title:** Commercial Business Machine Maintenance 1  
**Course Number:** 8716010  
**Course Credit:** 1

01.0 DEMONSTRATE PROFICIENCY IN SOFTWARE FUNDAMENTALS--The student will be able to:

- 01.01 Apply OS commands, syntax usage and parameters.
- 01.02 Demonstrate knowledge of OS file storage, FAT tables, boot record and disk partition procedures.
- 01.03 Identify OS utilities for technical personnel.
- 01.04 Demonstrate proficiency in protecting stored data.
- 01.05 Demonstrate an understanding and implementation of virus protection.
- 01.06 Understand, control and customize OS drivers.
- 01.07 Understand compression technologies for the trouble shooting of related problems.
- 01.08 Understand and apply procedures for memory management and computer environment configuring.
- 01.09 Demonstrate proficiency in the boot up process.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

**Course Title:** Commercial Business Machine Maintenance 2  
**Course Number:** 8716020  
**Course Credit:** 1

01.0 DEMONSTRATE PROFICIENCY IN SOFTWARE FUNDAMENTALS--The student will be able to:

- 01.10 Apply troubleshooting techniques for operating systems.
- 01.11 Describe the fundamentals of advanced graphical user interface (GUI) operating network systems.
- 01.12 Demonstrate usage of third party software diagnostic tools.

02.0 DEMONSTRATE PROFICIENCY IN CUSTOMER RELATIONS--The student will be able to:

- 02.01 Describe and demonstrate appropriate personal hygiene and professional attire.
- 02.02 Describe and demonstrate effective listening techniques.
- 02.03 Describe and apply techniques for instilling customer confidence and satisfaction.
- 02.04 Describe and apply techniques for keeping the customer informed.
- 02.05 Describe and apply effective follow-up techniques.
- 02.06 Demonstrate discretion in interacting with customers in field and retail environments.
- 02.07 Demonstrate an understanding of basic conflict resolution.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

**Course Title:** Commercial Business Machine Maintenance 3  
**Course Number:** 8716030  
**Course Credit:** 1

03.0 DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS--The student will be able to:

- 03.01 Write logical and understandable statements, or phrases, to accurately fill out forms and invoices commonly used in business and industry.
- 03.02 Read and use graphs, charts, diagrams, tables, parts manuals, and information sources commonly used in this industry/occupational area.
- 03.03 Read and follow written and oral instructions.
- 03.04 Answer and ask questions coherently and concisely.
- 03.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
- 03.06 Demonstrate appropriate telephone/communication skills.

04.0 DEMONSTRATE EMPLOYABILITY SKILLS--The student will be able to:

- 04.01 Prepare a resume.
- 04.02 Conduct a job search.
- 04.03 Secure information about a job.
- 04.04 Identify and provide documents, which may be required when interviewing for a job.
- 04.05 Complete a job application form correctly and completely.
- 04.06 Demonstrate competence in job interview techniques.
- 04.07 Identify and demonstrate appropriate responses to criticism from employer, supervisor or other employees.
- 04.08 Identify and demonstrate acceptable work habits.
- 04.09 Demonstrate knowledge of how to make job changes appropriately.
- 04.10 Demonstrate knowledge of employee health issues.
- 04.11 Demonstrate efficient organizational skills.
- 04.12 Demonstrate knowledge of the "Right-To-Know Law" as recorded in (29 CFR-1910.1200).

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

**Course Title:** Commercial Business Machine Maintenance 4  
**Course Number:** 8716040  
**Course Credit:** 1

05.0 DEMONSTRATE PROFICIENCY IN SOLDERING AND BASIC LABORATORY PRACTICES--The student will be able to:

- 05.01 Apply proper Occupational Safety Health Administration (OSHA) safety standards.
- 05.02 Make electrical connections.
- 05.03 Identify and use hand tools properly.
- 05.04 Identify and use power tools properly.
- 05.05 Demonstrate acceptable soldering techniques.
- 05.06 Demonstrate acceptable desoldering techniques.
- 05.07 Demonstrate electrostatic discharge (ESD) safety procedures.
- 05.08 Describe the construction of printed circuit boards (PCB's).
- 05.09 Explain the theoretical concepts of soldering.
- 05.10 Demonstrate rework and repair techniques.

06.0 DEMONSTRATE PROFICIENCY IN BASIC D.C. CIRCUITS--The student will be able to:

- 06.01 Solve problems in electronic units utilizing metric prefixes.
- 06.02 Identify sources of electricity.
- 06.03 Define voltage, current, resistance, power and energy.
- 06.04 Apply Ohm's law and power formulas.
- 06.05 Read and interpret color codes and symbols to identify electrical components and values.
- 06.06 Measure properties of a circuit using volt-ohm meter (VOM) and digital volt-ohm meter (DVM) and oscilloscopes.
- 06.07 Compute conductance and compute and measure resistance of conductors and insulators.
- 06.08 Apply Ohm's law to series circuits.
- 06.09 Construct and verify operation of series circuits.
- 06.10 Analyze and troubleshoot series circuits.
- 06.11 Apply Ohm's law to parallel circuits.
- 06.12 Construct and verify the operation of parallel circuits.
- 06.13 Analyze and troubleshoot parallel circuits.

07.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC MATH--The student will be able to:

- 07.01 Solve problems for volume, weight, area and circumference and perimeter measurements for rectangles, square and cylinders.
- 07.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, and feet and inches.
- 07.03 Add, subtract, multiply and divide using fractions, decimals and whole numbers.
- 07.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
- 07.05 Demonstrate an understanding of federal, state and local taxes and their computation.

- 08.0 DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE--The student will be able to:
- 08.01 Demonstrate an understanding of the effects of temperature extremes and moisture content in regards to electronic equipment.
  - 08.02 Demonstrate an understanding of the impact and effects of electrostatic discharge (ESD), power surges, grounding, and lighting strikes.
  - 08.03 Apply the scientific method to draw conclusions or make inferences from data.
  - 08.04 Demonstrate deductive reasoning techniques when troubleshooting.
  - 08.05 Demonstrate an understanding of the effects of heat load and ventilation in regards to electronic equipment.
  - 08.06 Identify safety and health related issues, including exposure to work related chemicals and hazardous materials, and demonstrate the appropriate precautionary measures.
  - 08.07 Demonstrate an understanding of environmental impact and regulations in regards to the appropriate disposal of electronic equipment.
- 09.0 DEMONSTRATE PROFICIENCY IN BASIC AC CIRCUITS--The student will be able to:
- 09.01 Identify properties of an AC signal.
  - 09.02 Identify AC sources.
  - 09.03 Analyze and measure AC signals utilizing VOM, DVM,

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

**Course Title:** Commercial Business Machine Maintenance 5  
**Course Number:** 8716050  
**Course Credit:** 1

10.0 DEMONSTRATE PROFICIENCY IN COMPUTER SYSTEMS ARCHITECTURE--The student will be able to:

- 10.01 Draw and explain systems configuration in block detail.
- 10.02 Perform personal computer system tear-down, cleaning and inspection.
- 10.03 Upgrade and troubleshoot a variety of motherboards.
- 10.04 Demonstrate knowledge of bus systems and processor architecture.
- 10.05 Understand and troubleshoot memory and cache systems.
- 10.06 Understand, troubleshoot and replace power supply systems.
- 10.07 Troubleshoot a microcomputer system.
- 10.08 Demonstrate system-upgrading techniques.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

**Course Title:** Commercial Business Machine Maintenance 6  
**Course Number:** 8716060  
**Course Credit:** 1

11.0 DEMONSTRATE PROFICIENCY IN PERIPHERAL EQUIPMENT--The student will be able to:

- 11.01 Demonstrate an understanding of input/output devices.
- 11.02 Identify and define serial and parallel interface standards.
- 11.03 Troubleshoot and replace video display hardware and monitors.
- 11.04 Troubleshoot, install and upgrade telecommunications devices and adapter cards.
- 11.05 Troubleshoot, install and upgrade multimedia hardware and software.
- 11.06 Troubleshoot, install and upgrade hard drives and CD-ROMS.
- 11.07 Troubleshoot and install tape and other mass data storage devices.
- 11.08 Troubleshoot, install and maintain printers.
- 11.09 Demonstrate professional connector assembly procedures.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

**Course Title:** Commercial Business Machine Maintenance 7  
**Course Number:** 8716070  
**Course Credit:** 1

12.0 DEMONSTRATE PROFICIENCY IN ELECTRONIC INFORMATION EXCHANGE--The student will be able to:

- 12.01 Install, connect and maintain network clients and peripherals to various network operating systems.
- 12.02 Demonstrate use of file systems commands and utilities on a network server.
- 12.03 Demonstrate setup configuring and sharing of user security, file, printer and network resources.
- 12.04 Demonstrate setup configuring and troubleshooting network applications on the server.
- 12.05 Demonstrate setup configuring and backup operation on the server or clients.
- 12.06 Demonstrate proficiency in performing help desk support for a network computer system.
- 12.07 Connect and configure computers for network connectivity.
- 12.08 Perform basic network system maintenance.
- 12.09 Describe use and system maintenance of a WAN and telecommunications system.
- 12.10 Perform procedures related to administration of a secure network.
- 12.11 Demonstrate knowledge of the Internet WAN system.
- 12.12 Demonstrate knowledge of network protocols.
- 12.13 Demonstrate knowledge of fundamentals of an internet system.
- 12.14 Demonstrate knowledge of telecommunications services and standards.
- 12.15 Un-install, configure and troubleshoot Internet/Internet access by using browsers.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

**Course Title:** Commercial Business Machine Maintenance 8  
**Course Number:** 8716080  
**Course Credit:** 1

13.0 DEMONSTRATE PROFICIENCY IN SITE REQUIREMENTS AND CONSIDERATIONS--  
The student will be able to:

- 13.01 Demonstrate knowledge of data communication test equipment.
- 13.02 Demonstrate knowledge of telecommunication wiring systems.
- 13.03 Demonstrate knowledge of cable and LAN topology.
- 13.04 Demonstrate knowledge of hubs, switches and routers.
- 13.05 Calculate and determine power requirements.
- 13.06 Calculate and determine requirements of the working environment.
- 13.07 Install, configure and troubleshoot LAN cable systems (twisted pair, coax, or fiber).
- 13.08 Configure and troubleshoot patch bay, hubs and transceivers.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

**Course Title:** Commercial Business Machine Maintenance 9  
**Course Number:** 8716090  
**Course Credit:** 1

14.0 DEMONSTRATE PROFICIENCY IN INSTALLATION OF COPIER SYSTEMS--The student will be able to:

- 14.01 Install and replace major office copier components.
- 14.02 Perform office copier systems checks.
- 14.03 Set up, and install office copier systems.
- 14.04 Perform cleaning and preventive maintenance on copiers.
- 14.05 Install copier related software.

15.0 DEMONSTRATE PROFICIENCY IN INSTALLATION OF PRINTER SYSTEMS--The student will be able to:

- 15.01 install and replace major office printer components.
- 15.02 Perform office printer systems checks.
- 15.03 Set up, and install office printing systems.
- 15.04 Install printer related software.

16.0 DEMONSTRATE PROFICIENCY IN MINOR PREVENTIVE MAINTENANCE OF PRINTER SYSTEMS--The student will be able to:

- 16.01 Perform cleaning and preventive maintenance on printers.
- 16.02 Perform basic trouble shooting of printer systems.

17.0 DEMONSTRATE PROFICIENCY IN MINOR PREVENTIVE MAINTENANCE OF COPIER SYSTEMS--The student will be able to:

- 17.01 Perform cleaning and preventive maintenance of copier systems.
- 17.02 Perform basic trouble shooting of copier systems.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

**Course Title:** Commercial Business Machine Maintenance 10  
**Course Number:** 8716100  
**Course Credit:** 1

18.0 DEMONSTRATE PROFICIENCY IN REPAIR OF COPIER SYSTEMS--The student will be able to:

- 18.01 Read and interpret schematics and block diagrams of office.
- 18.02 Determine the status of electro mechanical copier devices.
- 18.03 Determine the status of copier power supply systems.
- 18.04 Remove and replace copier power supply.
- 18.05 Determine the status of copier control boards.
- 18.06 remove and replace defective copier control boards.
- 18.07 Determine the status of copier optical systems.
- 18.08 Remove and replace optical systems.
- 18.09 Calibrate optic and control systems.
- 18.10 Determine status of fuse systems.
- 18.11 Demonstrate proficiency in installation of copier systems.

19.0 DEMONSTRATE KNOWLEDGE IN THE REPAIR OF ELECTRO MECHANICAL SYSTEMS--The student will be able to:

- 19.01 Repair paper feed systems.
- 19.02 Demonstrate an understanding of copy transfer and fusing.
- 19.03 Demonstrate understanding of electro static charging.
- 19.04 Demonstrate an understanding of developing.
- 19.05 Repair sorting systems.
- 19.06 Construct electrical connections.
- 19.07 Trouble shoot keyboards.
- 19.08 Make minor adjustments to keyboards and printing carriers.

Florida Department of Education  
STUDENT PERFORMANCE STANDARDS

**Course Title:** Commercial Business Machine Maintenance 11  
**Course Number:** 8716110  
**Course Credit:** 1

20.0 DEMONSTRATE PROFICIENCY IN REPAIR OF PRINTING SYSTEMS--The student will be able to:

- 20.01 Read and interpret schematics and block diagrams of printing systems.
- 20.02 Determine the status of electro mechanical printer devices.
- 20.03 Determine the status of printer power supply systems.
- 20.04 Remove and replace printer power supply.
- 20.05 Determine the status of printer control boards.
- 20.06 Remove and replace defective printer control boards.
- 20.07 Determine the status of fuse systems.
- 20.08 Demonstrate proficiency in initialization of printer systems.