

SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Electronic Systems Technology Program
Revision Date: August 26, 2019

I. CATALOG DESCRIPTION

Course Number: ELEC2753
Course Title: PC Operating Systems & Hardware
Prerequisite(s): None
Catalog Description: Current PC operating and hardware systems will be discussed and compared. An emphasis will be placed on installation, troubleshooting, security, and system maintenance.

Credit Hours: 3.5
Class Hours: 45
Lab Hours: 23
Total Contact Hours: 68

II. COURSE OBJECTIVES: *Course will:*

- A. Construct, configure and troubleshoot computer systems.
- B. Demonstrate the installation and modify configuration for Windows Operating Systems and Linux Operating Systems on computers.
- C. Verify configuration; troubleshoot serial communication devices connected to computer systems.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. Compare various PC operating systems and their capabilities.
 - 2. Assess various PC hardware configurations and capabilities.
 - 3. Evaluate to repair, upgrade and configure personal computer systems.
 - 4. Describe typical PC hardware configurations and standards.
 - 5. Formulate PC hardware and software troubleshooting techniques.
 - 6. Demonstrate the ability to install and configure business and home internet networking in a PC.
 - 7. Demonstrate the ability to configure and troubleshoot serial communications devices
- B. General Education Learning Outcomes (GELOs)
 - 1. GELO #3: Critical Thinking & Problem Solving
Outcome 2: Synthesize information to arrive at reasoned solutions to problems.

IV. CONTENT/TOPICAL OUTLINE

- A. PC Hardware
 - 1. Microprocessors
 - a. Intel
 - 1. A review of Intel processor evolution
 - b. AMD
 - 2. Motherboards
 - a. Form factors (AT, ATX, uATX, Mini-ITX, etc)
 - b. Features
 - 1. Onboard features
 - a. BIOS

1. Review of BIOS evolution
 2. Current BIOS capabilities
 2. Expansion features
 - a. Bus systems
 1. Legacy Busses ISA, VESA, EISA, AGP
 2. PCI, PCIX
 3. PCIe
 4. misc
 - b. Memory
 1. SIMM vs. DIMM
 2. DDR Versions
 3. Other Memory Technologies
 - c. Other standard I/O interfaces
 1. Serial Port (RS-232)
 2. Parallel Port
 3. USB
 - a. Review of USB evolution
 - b. USB interface specs
 - c. USB devices
 4. IEEE 1394 (firewire)
 - a. Review of firewire evolution
 - b. Firewire interface specs
 - c. Firewire devices
 5. PS/2 interfaces
 6. Game ports
 7. Audio Connections
3. Mass storage systems
 - a. Interfaces
 1. IDE
 2. SCSI
 3. SATA
 4. Fiber-channel
 5. Floppy drive interface
4. Display Systems
 - a. VGA / DVI / HDMI / Display Port Connectors
 - b. Resolution and Refresh Rate
5. Misc. cables and connectors
 - a. Cabling and Connector Identification
6. PC power and power supplies
 - a. Power protection
 - b. Power supplies and connections
 - c. PC cooling
- B. PC system boot process
 1. Overview of boot process
 2. Troubleshooting the boot process
- C. Computer Assembly Overview
 1. ESD Precautions
 2. CPU and RAM Alignment
 3. Screw Sizes
- D. Command Line Interface
 1. MS-DOS Environment

- a. Basic utility commands
 - b. Batch files
- E. Windows Operating Systems
 - 1. Windows 3.x Overview
 - a. Brief overview of Windows 3.x
 - b. Legacy Support Topics
 - 2. Windows 95/98/ME Overview
 - a. Evolution of versions
 - b. Legacy Support Topics
 - 3. Windows XP installation and configuration
 - a. Installation Procedures
 - 1. Operating system
 - 2. Hardware
 - 3. Other software
 - b. Windows XP configuration
 - 1. Configuration Utilities
 - 2. The Registry
 - 3. Add-ons
 - c. Windows XP troubleshooting
 - 1. Troubleshooting tools
 - 2. Common Problems
 - 3. Troubleshooting methods
 - d. Windows Vista/Windows 7
 - 1. New features
 - 2. Windows Vista/Windows 7 installation
 - 3. Windows Vista/Windows 7 configuration
 - e. Windows 8
 - 1. New features
 - 2. Windows 8 installation
 - 3. Windows 8 configuration
- F. LINUX Installation and configuration in a desktop scenario
 - 1. Installation Methods
 - a. Installation sources
 - b. Installation types
 - 2. Using Linux
 - a. Command line interface
 - b. Graphical interface
 - c. Hardware and software installation and configuration
 - 3. Linux Applications
 - a. Common Applications
 - b. Server type applications
- G. PC Operating System networking
 - 1. Networking overview
 - 2. Windows networking setup
 - a. LAN and Dial-up adapters
 - b. TCP/IP configuration
 - c. Internet Connection Sharing
 - d. Internet Firewall
 - 3. Linux networking setup
 - a. LAN and Dial-up adapters
 - b. TCP/IP configuration

- c. Linux Internet Firewall
 - d. Internet Firewall and Connection sharing overview
- H. Laboratory Exercises
 - 1. PC interface recognition exercise
 - 2. Build a computer exercise
 - 3. Command line usage and batch files
 - 4. Windows installation and configuration
 - 5. Windows new hardware and software installation
 - 6. Windows Internet Connections and Sharing
 - 7. Linux installation and configuration
 - 8. Misc. PC hardware and software repair and troubleshooting
- V. **INSTRUCTIONAL MATERIALS**
 - A. Required Text(s): *A+ Guide to Managing and Maintaining Your PC*, 8th Edition, ISBN-13: 978-1-133-13509-8
 - B. Other Resources: Various Internet Sites
 - C. Outside Reading/Research Required: As assigned
 - D. Supplies: 3-Ring notebook
- VI. **METHODS OF PRESENTATION/INSTRUCTION**
 - A. Methods of presentation typically include a combination of the following:
 - 1. Technology enhanced lecture
 - 2. Classroom discussion
 - 3. Interactive group activities
 - 4. Audio visual materials
 - 5. Presentation by experts for the Electronics and Networking industry
- VII. **METHODS OF EVALUATION**
 - A. Methods of evaluation, although determined by the individual instructor, traditionally includes a combination of the following:
 - 1. Exams and quizzes
 - 2. Attendance and participation
 - 3. Daily assignments
 - 4. Performance and observational assessment
- VIII. **SPECIFIC COURSE REQUIREMENTS**
 - A. A minimum grade of D is required.
 - B. Credit by Examination: Credit for the course CANNOT be earned through Credit by Examination.