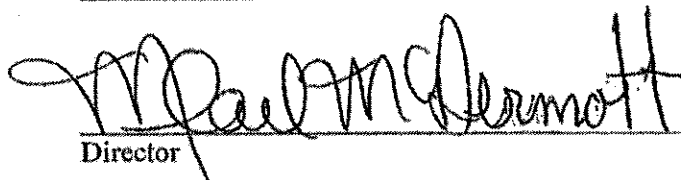


## Signature Page

The College and CTC will agree not to discriminate in their educational programs, activities or employment practices based on race, color, national origin, sex, sexual orientation, disability, age, religion, ancestry, union membership or any other legally protected classification.

Announcement of this policy is in accordance with state law, including the Pennsylvania Human Relations Act, and with federal law, including Titles VI and VII of the Civil Rights Act of 1964, Title IX of the Educational Amendments of 1972, Section 503 and 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, and the Americans with Disabilities Act of 1990. Inquiries should be directed to the Affirmative Action Officer (presently Sylvia Detar) at 724-925-4190 or in Room 4100D, Westmoreland Business & Industry Center, Youngwood, PA 15697.

### For the CTC:

 03/24/21  
\_\_\_\_\_  
Director Date

### For the College:

 3/24/21  
\_\_\_\_\_  
Kristy A. Bishop, Ph.D. Date  
Vice-President of Academic Affairs

**Appendix I**  
**Articulated Courses**

**Guide for Local Articulation**

Curriculum Guide for the articulation of Computer System Networking and Telecommunications  
college coursework and credit between WCCC and ICTC

WCCC

CPT 145 Introduction to Computer Technology (3 cr.)

CPT 181 Introduction to Telecommunications (3 cr.)

CPT 182 Operating Systems (3 cr.)

CPT 183 Local Area Networks (3 cr.)

CPT 248 PC Hardware (3 cr.)

CPT 249 PC Troubleshooting (3 cr.)

ICTC

CIP 11.0901

## **Course Outline**

### **Course Information**

A. Course Title:	Introduction to Information Processing
B. Course Number:	CPT 145
C. Lecture, Lab and Credit Breakdown:	3-0-3
D. Course Prerequisite:	None

### **Catalog Description**

This survey course provides students with an overview of computer technology topics- hardware, software, networking, Internet, data management, system design, ethical issues, mobile computing, programming and careers in computer technology. It is designed as a first course for students pursuing a degree in the computer field.

### **General Course Objectives**

This course will develop students' knowledge of:

- Technical terminology related to computers, electronic communications, and application software.
- Digital systems, communications networks, and applications in use today.
- The societal impact of Information Systems.
- The functions of an operating system, including allocating system resources, and media and file management.
- Control structures and development issues associated with computer programming.
- Bibliographic resources to identify and synthesize current information.

### **Outcomes**

Upon successfully completing this course, students will be able to:

- Use correct terminology associated with digital information processing.
- Identify media, hardware, software, and procedural components linking telecommunications systems.
- List the advantages and disadvantages of database systems – relational, object-oriented, multi-dimensional.
- Analyze Web information sources for relevance and accuracy; and synthesize, evaluate, and communicate the results, demonstrating competencies at the college level.
- Describe how an Information System is used citing examples from business, education, and personal use.
- Compare and contrast operating systems found on a variety of devices.
- Describe the role and use of application software in a variety of settings – business, education, personal.
- Identify and describe activities involved in designing and developing computer programs.
- Identify positive social and ethical behaviors when using technology and the consequences of misuse.

### **Topical Course Outline**

1. Introduction to course
2. Hardware
  - a. CPU and Memory
  - b. Data storage devices
  - c. Input/Output devices
3. Software
  - a. Standards
  - b. Application software
4. System software
  - a. Standard options
  - b. Windows
  - c. Linux
  - d. Macintosh
5. Networks
  - a. Communication basics
  - b. The Internet and the World Wide Web
  - c. Web Pages
6. Information Systems in Business
  - a. Software Development
  - b. Computers -- Design a System
7. Social Issues
8. Programming
  - a. Language choice
  - b. Logic structures
  - c. Process

### **References, Resources, and Learning Materials:**

Material available in the Learning Resources Center Reviewed and approved by:

  
Division Dean

  
Date



## COURSE OUTLINE

### Course Information

A. Course Title:	Introduction to Telecommunication
B. Course Number:	CPT 181
C. Lecture, Lab and Credit Breakdown:	3/0/3
D. Course Prerequisite(s):	None

### Catalog Description

Covers Telecommunications, its role in business and in informal systems and the planning and design of a telecommunications system. Basic communications theory, components of data communications systems, error detection techniques, network protocols, and line control procedures, communication carrier facilities, and system planning considerations are covered

### Learning Objectives

The purpose of this course is to:

- Understand common body of terms, coding, process and procedures used in the area of telecommunication as used in system component acquisition.
- Understand contemporary connectivity topics, compare and contrast different technologies related to data communications, emphasis on high data transfer and low emergency consumption.
- Utilize popular operating environments to show how they generate and transmit information focusing on security and sustainability of communications.
- Analyze and utilize various communications media, their similarities and differences with analysis of speed, security, efficiency, reliability, and cost.
- Utilize the ISO Reference Model to differentiate underlying functions of data communication in computer networks
- Use the IEEE 802 networking standards to identify, define and specify acquisition specifications for hardware and software for data communications.
- Utilize the Internet and traditional resources to gather and synthesize information about different network types and network protocols
- Understand the key concepts related to computer network administration and security.

## Course Outcomes

Upon successfully completing this course, students will be able to:

- Define and use terminology associated with the telecommunications field
- Compare and contrast various file conversion techniques and high speed data transfer.
- Identify and define hardware and software components of data communications systems.
- Compare and contrast the use of workstations, personal computers, terminals and tablet/notebook computer and the Internet of Things, in networks.
- Compare and contrast the networking capabilities of various operating systems, including DOS/PowerShell, Microsoft/Windows, Unix/Linux, and open source process control systems.
- Describe various types of communications media, methods, and transfer processes.
- Define the layers of the ISO reference model as applied to secure packet switching technology.
- Identify LAN topologies and with the implications of system security.
- Describe the various coding schemes used in telecommunications.
- Describe the HTTP, TCP, and IP protocols function in networks and network security.
- Discuss the factors that affect wireless signal propagation and security.
- Describe the role of routers, and switches in a typical network.

## Topical Course Outline

1. Introduction to Computer Networks and Data Communication
2. Fundamentals of Data and Signals
3. Conducted and Wireless Media
4. Interfacing Computer Connections
5. Efficient Connections through Multiplexing and Compression
6. Errors, Error Detection and Error Control
7. Local Area Networks, architecture, protocols, software, and administration
8. Metropolitan Area Networks and Wide Area Networks
9. Internet communication, protocol, software, services and security
10. Voice and Data delivery networks
11. Network Security
12. Network Design and Management

## **References, Resources, and Learning Materials Text:**

Materials available in the Learning Resource Center

Reviewed and Approved by:

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Division Dean

Date



## COURSE OUTLINE

### Course Information

A. Course Title:	Operating Systems
B. Course Number:	CPT 182
C. Lecture, Lab and Credit Breakdown:	3-0-3
D. Course Prerequisite(s):	CPT 145

### Catalog Description

This course is designed to introduce students to the concepts, components and technologies found in desktop based operating systems. Operating Systems explores the fundamentals with an overview of MS-DOS and provides hands-on experience with a Windows desktop client OS. Topics include but are not limited to: installation, configuration, operation, and troubleshooting of a commonly used operating system.

### Learning Objectives

The purpose of this course is to:

Develop students' knowledge of and skill using:

- Options for DOS and the Windows desktop operating system (OS).
- Resources for managing and troubleshooting a Windows desktop OS.
- Hardware device and driver configuration and troubleshooting techniques for a desktop OS.
- The desktop and user environment configuration and troubleshooting.
- Network protocols and services for Internet access.
- The requirements for setting up and managing a home network.
- Security issues associated with a home network

### Course Outcomes

- Upon successfully completing this course, students will be able to:
- Describe the differences between versions of Windows for desktop PCs.
- Perform and troubleshoot an attended installation of DOS and a Windows OS with upgrades.
- Install hardware and applications, setting up user accounts, and customizing the Windows desktop after installation.
- Use Windows support tools for hardware, software, and network management.
- Compare, contrast, configure, and use security features in different versions of Windows.
- Describe how the startup process differs between recent versions of Windows.
- Describe strategies to use when troubleshooting Windows startup problems.



- Configure and troubleshoot user account control, Windows defender, and dynamic security for Internet Explorer and Windows firewall.
- Configure and troubleshoot media, mail, and other Windows applications.
- Troubleshoot performance issues and reliability issues using diagnostic tools.
- Configure data protection for a home network.

### Topical Course Outline

- A. Introduction to Operating Systems — DOS and Windows
  - a. Historical overview
  - b. Functions of an Operating System
- B. Installing DOS and Windows
  - a. Hardware requirements
  - b. Software compatibility
  - c. Device drivers
- C. Using system utilities
- D. Managing disks and file systems
- E. User management
- F. OS security features
- G. Home and local networking
  - a. Workgroups
  - b. Configure a router and select encryption
  - c. Configure a firewall
- H. User productivity and media tools
- I. Performance enhancement — reliability and monitoring
- J. Application support
- K. Disaster recovery and troubleshooting

### References, Resources, and Learning Materials Text:

Material available in the Library

Reviewed and Approved by:

Division Dean

Date



## COURSE OUTLINE

### Course Information

Course Title:	Local Area Networks
Course Number:	CPT 183
Lecture, Lab and Credit Breakdown:	3/0/3
Course Prerequisite:	CPT 181

### Catalog Description

This course is designed to provide the concepts, components, terminology and topologies of Local Area Networks (LANs). Training issues will include network concepts, network essentials maintenance and network administration. Efficient and effective network methodologies are presented to enhance network management fundamentals.

### Learning Objectives

The purpose of this course is to:

Develop students' skill and knowledge of:

- Concepts, components, terminology and topologies of Local Area Networks.
- The benefits of network packet switching, TCP/IP sub-netting and the interrelation between them.
- The characteristics and attributes of network operating systems – Novell, UNIX, Windows.
- The role of the network administrator in the development, management, and maintenance of LANs.
- Technical resources for selection, evaluation, and implementation of the most effective LAN for a given scenario.

### Course Outcomes

Upon successfully completing this course, students will be able to:

- Describe networking, networking communications, centralized computing, distributed computing, and cooperative computing.
- Explain basic networking elements and the roles of clients, servers, and peers as they relate to computer networks.
- List and describe characteristics of transmission media to include: cost, ease of installation, capacity, attenuation, fire protection coding, and immunity from interference.
- Configure RJ45 connector on unshielded twisted pair cable, install and trouble shoot the segment, use cable-testing equipment to test cable status and use tone generators to isolate cable segments.
- Configure unshielded twisted pair cable into a punch down block using a punch down tool.

- Identify the public network services that expand the capabilities of private networks.
- Identify the appropriate transmission media that meets business objectives, identify and describe the connectivity hardware used to network computers, and to internetwork computers for a given scenario.
- List and define the seven layers of the OSI model, and using the OSI reference model, describe how network protocols interact within their own local stack and with peer layers in other stacks.
- Describe the usefulness of the OSI reference model as a conceptual tool for packet switching
- Identify and describe the network technology topics associated with the seven-layer OSI model.
- Integrate the use of micro segmentation switches into a network design to maintain the Ethernet 40% rule.
- Define baseband and broadband transmission technologies and describe when each may be used.
- Subnet an IPv4 addressing scheme.
- Decide what kinds of cabling and connections are appropriate for particular networking environments.
- Describe wireless transmission techniques used in LANs, and describe signaling technologies used for mobile computing.
- Describe the role of the network adapter card and drivers in networked communications.
- Define the variety of configurable options for network adapters and describe common settings.
- Explain the IEEE 802 networking model and related standards.
- Describe the function and structure of packets in a network.
- Describe protocols and channel access methods.
- Define interconnectivity issues in a multi-vendor environment, the aspects of network monitoring for benchmarking and monitoring network performance.
- Define a procedure to protect file servers from data loss.
- Explain how enterprise networks are implemented with devices such as repeaters. Bridges, routers, gateways, and switches.

### Topical Course Outline

1. Review & Benefits of networking
2. Network types
3. Network Design Essential
4. Network Media
5. Network Interface Cards
6. OSI stack, protocols, Network Software Network Communication and Protocols
7. Network Architecture
8. Simple Network Operations
9. Understanding Complex Networks Network Administration and Support Enterprise and Distributed Networks Wide Area and Large
10. Scale Networks Solving Network Problems

11. Understanding and Using Internet Resources Basic Network administration

References, Resources, and Learning Materials Text:

Material available in the Library

Reviewed and Approved by:

B. e. Kous  
Division Dean

10/28/19

Date

## **COURSE OUTLINE**

### **COURSE INFORMATION**

- |  |                            |
|--|----------------------------|
| A. Course Title:                         | Personal Computer Hardware |
| B. Course Number:                        | CPT 248                    |
| C. Lecture, Lab and<br>Credit Breakdown: | 3/0/3                      |
| D. Course Prerequisite:                  |                            |

### **CATALOG DESCRIPTION**

CPT 248-Personal Computer Hardware 3-0-3

Focuses on computer components, ranging from peripherals such as monitors and printers; storage devices including diskette drives, hard drives, and CD ROM drives; and internals such as microprocessors and expansion boards. Students will learn to configure systems for user specific needs and to upgrade existing systems.

### **GENERAL COURSE OBJECTIVES**

This course will develop students' knowledge of and ability to:

- Identify the major components of a personal computer.
- Develop confidence in his/her ability to learn the layout and assembly/disassembly of personal computer systems.
- Acquire trouble-shooting skills.
- Work with computer technical problems diagnosing complete system scenarios.
- Documentation methods to assist in assembly/disassembly and troubleshooting.
- Research known hardware and software issues.
- Install and use software and hardware diagnostic programs.

### **LEARNING OUTCOMES**

Upon successfully completing this course, students will be able to:

- Define the physical layout of a microcomputer system. (Communication 1)
- Assemble and disassemble a microcomputer system. (Critical Thinking 2)
- Understand procedures and techniques of microcomputer operation.
- Troubleshoot and replace defective hardware components.
- Setup and maintain operating system software and test software performance.
- Configure software to meet hardware requirements. (Critical Thinking 2)
- Test the performance of a microcomputer system. (Critical Thinking 2)
- Perform preventative maintenance on a personal computer system. 8. Upgrade a microcomputer system.
- Install, maintain, and troubleshoot microcomputer peripherals. (Critical Thinking 2)

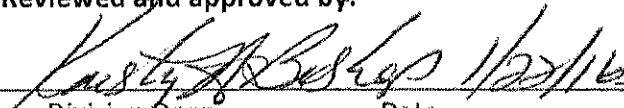
### **TOPICAL COURSE OUTLINE Topical Outline**

- I. Course Overview
11. Exploring the Physical Layout of a Microcomputer System

1. Hardware
2. . Software
3. Operating System
- III. Understanding Microprocessors and memory
  1. Types of Microprocessors
  2. Memory (RAM and ROM)
  3. Testing and measuring memory
- IV. Expansion boards and buses
  1. Types of buses
  2. Video buses
  3. Serial and Parallel I/O ports
  4. . Floppy and Hard disk controllers
- V. Approaches to analyzing and troubleshooting the PC system
  1. Testing the overall system
  2. Testing individual parts of the system
  3. Making your tests count
  4. Testing your application software
  5. Using diagnostic test software to pinpoint the problems
- VI. Identifying configuration problems
  1. Software configuration problems
    - a. device drivers
    - b. memory
    - c. disk storage
  2. Hardware configuration problems
- VII. Understanding and detecting computer viruses
  1. What is a virus?
  2. Preventing viruses
  3. Detecting viruses
  4. Removing viruses
- VIII. Understanding diskettes and hard drives
  1. Types of hard drive interfaces
  2. . Physical characteristics of a disk
  3. Interleave and sector numbering
  4. Improving disk performance
  5. . Disk Performance (Access time, transfer rate, etc.)
  6. Installing hard drives
- IX. Video adapters and monitors
  1. Understanding video adapters
  2. . Video standards
  3. Types of monitors
  4. Testing your video system
- X. Testing and understanding I/O Ports
  1. Introducing parallel and serial ports
  2. Understanding parallel I/O
  3. . Understanding serial I/O
  4. Understanding DOS interrupt assignments (IRQ)

- 5. DOS redirection
- XI. Understanding and working with printers
  - 1. Types of printers, (DOT Matrix, laser, inkjet[DeskJet])
  - 2. Understanding printer drivers and application software configurations
  - 3. Cleaning and preventative maintenance
  - 4. Troubleshooting printer problems
- XII. Modem installation and troubleshooting
  - 1. Serial port configuration (IRQ assignment and COM port assignment)
  - 2. Understanding protocols, (baud rate, data bits, stop bits and parity)
  - 3. Cabling and testing
  - 4. Understanding the Hayes command set
- XIII. Introduction to alternative operating systems
  - 1. DOS
  - 2. Windows Professional
  - 3. Windows 98
  - 4. . Windows NT Workstation

**Reviewed and approved by:**

  
\_\_\_\_\_  
Division Dean                      Date

## **COURSE OUTLINE**

### **COURSE INFORMATION**

A. Course Title:	Personal Computer Troubleshooting
B. Course Number:	CPT 249
C. Lecture, Lab and Credit Breakdown:	3/0/3
D. Course Prerequisite:	CPT 248 and CPT 182

### **CATALOG DESCRIPTION**

Cover essential competencies for a break/fix microcomputer hardware service technician. Advanced topics include how to properly install, configure, upgrade, troubleshoot and repair microcomputer hardware. Students will get basic knowledge of desktop and portable systems, networking concepts and printers.

### **GENERAL COURSE OBJECTIVES**

Personal Computer Hardware II is designed to introduce the student to the concepts, components, and technology found in break/fix service technology. After the completion of the course the student will:

1. Install configure, and upgrade system boards and peripheral devices and memory.
2. Diagnosis and troubleshoot systems.
3. Perform preventive maintenance.
4. Identify and practice safety procedures.
5. Installing and configuring peripheral devices.
6. Identify types of motherboards, processors, and memory.
7. Identify and troubleshoot printer problems.
8. Navigate file structures and file management systems.
9. Establish effective customer satisfaction.
10. Installing, configuring, and updating operating systems.

### **LEARNING OUTCOMES**

Specific Learner Objectives/Competencies

The student will have the necessary knowledge and skills to:

1. Installation, and configuration, field replaceable modules. (Critical Thinking 2)
2. Upgrade operating systems, and loading device drivers necessary for certain devices. (Critical Thinking 2)
3. Perform alternate was of booting operating systems and creating emergency repair disks. (Critical Thinking 2)
4. Identify and upgrade BIOS.
5. Diagnosing and troubleshooting common symptoms and problems. (Critical Thinking 1)
6. How to elicit problem symptoms form customers. (Communication 1)
7. Implement preventive maintenance products and procedures.
8. Practice proper management of ESD precautions and procedures.
9. Identify configure and test motherboards, processors memory and CMOS.
10. Identify printer types.
11. Identify care and service techniques and common problems with primary printer types. (Interpersonal 3)

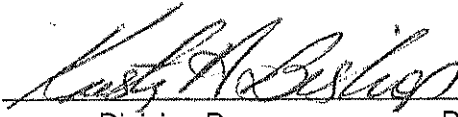


12. Providing virus protection and how to remove viruses. (Critical Thinking 2)
13. Identify procedures for swapping and configuring network interface cards.
14. Identify the networking capabilities of operating systems, including procedures for connecting to the network. (Critical Thinking 2)
15. Differentiate effective from ineffective behaviors as these contribute to the maintenance of achievement of customer satisfaction (Technology 1)

#### **TOPICAL COURSE OUTLINE**

Introduction, Microprocessor fundamentals  
PC Hardware  
Trouble shooting  
Operating Systems  
Windows software  
System Board  
Input Output Devices  
Magnetic Storage video displays  
Printers  
Data Communications and Networking  
Multimedia  
Preventive maintenance and safety

**Reviewed and approved by:**

 1/22/16  
\_\_\_\_\_  
Division Dean                      Date