

Common Course Outline
DCOM 141
Introduction to PC Operation and Repair
4 Semester Hours

Community College of Baltimore County

Description

DCOM 141 – 4 credits - Introduction to PC Operation and Repair provides an introduction to the expansive microcomputer field. The course focuses on microcomputer operating systems, broad concepts, and diagnostic tools that allow the student to rapidly determine the condition of a PC system and how best to rectify a fault.

This is the first of a two course sequence designed to help prepare the student for the CompTIA A+ certification examinations.

4 credits; 4 lecture hours per week

Prerequisite: CINS 101 or consent of the program coordinator

Overall Course Objectives

Upon completion of this course, the student will be able to:

1. identify different internal and external components of a microcomputer;
2. identify basic procedures for adding and removing field replaceable modules for desktop systems;
3. recognize common problems associated with each module and their symptoms, and identify steps to isolate and troubleshoot the problems;
4. identify basic troubleshooting procedures and tools and how to elicit problem symptoms from customers;
5. identify different types of buses;
6. describe the safety hazards involved in working with electronic equipment;
7. identify the names, locations, purposes, and contents of major system files;
8. install and configure Windows operating systems;
9. recognize and interpret the meaning of common error codes and startup messages from the boot sequence, and identify steps to correct the problem;
10. demonstrate the ability to install and effectively use command-line functions and utilities to manage the operating system, including the proper syntax and common switches;
11. identify basic concepts and procedures for creating, viewing, and managing disks directories and files;
12. identify the major operating system utilities, their purpose, location, and available switches;

13. identify procedures for installing/adding a device, including loading/adding/configuring device drivers and required software; and
14. use documentation, software diagnostics, tools, and parts to make repairs to microcomputer equipment.

Major Topics

I. Introducing Hardware

1. Hardware Needs Software to Work
2. PC Hardware Components
3. Hardware Used for Input and Output
4. Hardware Inside the Computer Case
5. The Motherboard
6. The CPU and the Chip Set
7. Storage Devices
8. Motherboard Components Used for Communication Among Devices
9. Interface (Expansion) Cards
10. The Electrical System
11. Instructions Stored on the Motherboard and Other Boards
12. Motherboard Configuration Settings
13. **Hands-on Lab:** Introducing Hardware

II. How Hardware and Software Work Together

1. Introducing Operating Systems
2. What an Operating System Does
3. An OS Provides a User Interface
4. An OS Manages Files and Folders
5. An OS Manages Applications
6. An OS Manages Hardware
7. System Resources
8. Interrupt Request Number (IRQ)
9. Memory Addresses
10. I/O Addresses
11. DMA Channels
12. OS Tools to Examine a System
13. Device Manager
14. System Information
15. Microsoft Diagnostic Utility (MSD)
16. **Hands-on Lab:** How Hardware and Software Work Together

III. Understanding the Boot Process and Command Line

1. Booting Up Your Computer
2. Startup BIOS Controls the Beginning of the Boot
3. Emergency Startup Disks
4. Using the Command Prompt

5. Accessing a Command Prompt
6. Launching a Program Using the Command Prompt
7. File and Directory Naming Conventions
8. Wildcards
9. Commands to Manage Disks, Hard Drives, Files, and Directories
10. Using Batch Files
11. **Hands-on Lab:** Understanding the Boot Process and Command Line

IV. Electricity and Power Supplies

1. Measures and Properties of Electricity
2. AC and DC
3. Hot, Neutral, and Ground
4. Some Common Electronic Components
5. Protecting Your Computer System
6. Static Electricity
7. EMI (Electromagnetic Interference)
8. Surge Protection and Battery Backup
9. The Computer Case and Form Factors
10. Case, Power Supply, and Motherboard Form Factors
11. Types of Cases
12. Detecting and Correcting
13. Power Supply Problems
14. Upgrading Your Power Supply
15. Introduction to Troubleshooting
16. Troubleshooting the Power System
17. Energy Star Systems
18. (The Green Star)
19. Power Management Methods and Features
20. Energy Star Monitors
21. **Hands-on Lab:** Electricity and Power Supplies

V. The Motherboard

1. Types of Motherboards
2. Components on the Motherboard
3. The CPU and the Chip Set
4. ROM BIOS
5. Buses and Expansion Slots
6. Hardware Configuration
7. Protecting Documentation and Configuration Settings
8. Building a Computer:
9. An Introduction
10. Installing the Motherboard
11. Preparing the Motherboard to Go into the Case
12. Installing the Motherboard in the Case
13. Completing the Installation
14. Troubleshooting the Motherboard and CPU

15. **Hands-on Lab:** The Motherboard

VI. Supporting Windows 9x

1. Windows 9x Architecture
2. Virtual Machines
3. Installing Windows 9x, Hardware,
4. and Software
5. Installing Windows 9x
6. Installing Hardware with Windows 9x
7. Installing Applications in Windows 9x
8. Using Windows 9x
9. Keystroke Shortcuts in Windows
10. Managing the Windows 9x Desktop
11. Windows Explorer Device Manager
12. Booting Windows 9x
13. Files Used to Customize the Startup Process
14. The Windows 9x Startup Process
15. Troubleshooting Tools for Windows 9x
16. System Applet in the Control Panel System Monitor
17. System Configuration Utility
18. Dr. Watson
19. The Windows 9x Registry
20. Troubleshooting Windows 9x
21. Troubleshooting Windows 9x Installations
22. Troubleshooting the Windows 9x Boot Process
23. Troubleshooting Windows 9x Hardware and Software
24. **Hands-on Lab:** Supporting Windows 9x

VII. Understanding and Installing Windows 2000 and Windows NT

1. Windows NT/2000/XP Architecture
2. Windows NT/2000/XP Modes
3. Networking Features
4. How Windows NT/2000/XP Manages Hard Drives
5. Installing Windows 2000 Professional
6. Planning the Installation
7. Verifying the Installation
8. Backing Up the System State
9. Installing Hardware and Applications Under Windows 2000
10. Installing Hardware
11. Installing Applications
12. Supporting Windows NT
13. Installing Windows NT as the Only OS
14. Troubleshooting the Windows NT Boot Process
15. **Hands-on Lab:** Understanding and Installing Windows 2000 and Windows NT

VIII. Managing and Troubleshooting Windows 2000

1. Understanding the Windows NT/2000/XP Boot Process
2. Customizing the Windows NT/2000/XP Boot Process
3. Troubleshooting the Windows 2000 Boot Process
4. Advanced Options Menu
5. Recovery Console
6. Emergency Repair Process
7. Tools For Maintenance and Troubleshooting
8. Using the Backup Tool to Restore the System State
9. Windows 2000 Support Tools
10. Windows File Protection
11. Computer Management
12. Microsoft Management Console
13. Performance Monitoring and Optimization
14. Dr Watson and Memory Dumps
15. Windows Update,
16. **Hands-on Lab:** Managing and Troubleshooting Windows 2000

IX. Installing and Using Windows XP Professional

1. Features and Architecture of Windows XP
2. Windows XP Features
3. Windows XP Architecture
4. Installing Windows XP
5. Planning the Installation
6. Installation Process
7. After the Installation
8. Using Windows XP
9. Customizing the Windows XP Desktop
10. Managing Audio and Video
11. Multiple Logins and Remote Assistance
12. Installing Hardware and Applications
13. Installing Hardware
14. Installing Applications
15. **Hands-on Lab:** Installing and Using Windows XP Professional

X. Managing and Supporting Windows XP

1. Security Using Windows NT/2000/XP
2. User Accounts and Profiles
3. EFS (Encrypted File System)
4. Internet Connection Firewall
5. The Windows NT/2000/XP Registry
6. How the Registry Is Organized
7. Editing the Registry
8. Other Maintenance and Troubleshooting Tools
9. Help on the Web
10. Troubleshooting the Boot Process

11. System Restore
12. MS-DOS Startup Disk
13. Windows XP Boot Disk
14. Automated System Recovery
15. Error Messages and Their Meanings
16. **Hands-on Lab:** Managing and Supporting Windows XP

XI. Troubleshooting and Maintenance Fundamentals

1. Troubleshooting Perspectives and Tools
2. Troubleshooting Tools
3. Your Approach to Troubleshooting
4. Fundamental Rules
5. Gathering Information
6. Preventive Maintenance
7. When a PC Is Your Permanent Responsibility
8. A Preventive Maintenance Plan
9. Moving Equipment
10. Disposing of Used Equipment
11. **Hands-on Lab:** Troubleshooting and Maintenance Fundamentals

Course Requirements

Grading: Grading procedures will be determined by the individual faculty member and be provided the first week of class. Grading will include the following: a minimum of five (5) major graded assignments (possibly including hourly exams, a midterm exam and/or lab projects) plus a final examination.

Other Course Information

This course is a program requirement for the Network Technology Degree Options and a requirement for the A+ Certificate. This course, along with DCOM 235 helps prepare students for the A+ certification exams offered by CompTIA. This course is taught in a combination lecture and hands-on computer laboratory format.

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