

## IT Essentials: PC Hardware and Software (CPMT 1351)



**Credit:** 3 semester credit hours (2 hours lecture, 4 hours lab)

**Prerequisite/Co-requisite:** None

### Course Description

An introduction to the computer hardware and software skills needed to help meet the growing demand for entry-level information and communication technology (ICT) professionals. The curriculum covers the fundamentals of PC technology, networking, and security, and also provides an introduction to advanced concepts. Hands-on labs and Virtual Laptop and Virtual Desktop learning tools help students develop critical thinking and complex problem-solving skills. Cisco Packet Tracer simulation-based learning activities promote the exploration of network and networking security concepts and allow students to experiment with network behavior.

### Required Textbook and Materials

1. *Mike Meyers' CompTIA A+ Guide to Managing and Troubleshooting PCs, 4th Edition (Exams 220-801 & 220-802)* by Michael Meyers.

ISBN: 978-0-07179-591-3

2. A portable external Hard Drive with a capacity of 500GB or larger.

### Course Objectives

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

1. Describe the internal components of a computer. (Scans C1, C5, C6, C7, C8, C9, C18, C19, C20, F1, F2, F5, F7, F9, F11, F12, F13, F14, F16)
2. Assemble a computer system. (Scans C1, C5, C6, C7, C8, C9, C18, C19, C20, F1, F2, F5, F7, F9, F11, F12, F13, F14, F16)
3. Install an operating system. (Scans C1, C5, C6, C7, C8, C9, C18, C19, C20, F1, F2, F5, F7, F9, F11, F12, F13, F14, F16)
4. Troubleshoot using system tools and diagnostic software. (Scans C1, C5, C6, C7, C8, C9, C18, C19, C20, F1, F2, F5, F7, F9, F11, F12, F13, F14, F16)

### SCANS Skills and Competencies

Beginning in the late 1980's, the U.S. Department of Labor Secretary's Commission on Achieving Necessary Skills (SCANS) conducted extensive research and interviews with business owners, union leaders, supervisors, and laborers in a wide variety of work settings to determine what knowledge workers needed in order to perform well on a job. In 1991 the Commission announced its findings in *What Work Requires in Schools*. In its research, the Commission determined that "workplace know-how" consists of two elements: foundation skills and workplace competencies. .

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## Course Syllabus

### Course Outline

- A. The Path of the PC Tech
  - 1. The Importance of Skill in Managing and Troubleshooting PCs
  - 2. How Do I Become CompTIA A+ Certified?
- B. Operational Procedures
  - 1. The Professional Tech
  - 2. Communication
  - 3. Safety and Tools
- C. The Visible PC
  - 1. How the PC Works
  - 2. The Art of the Technician
  - 3. The Complete PC
  - 4. Inside the System Unit
- D. Visible Windows
  - 1. A Brief History of Microsoft Windows
  - 2. The Windows Interface
  - 3. Operating System Folders
  - 4. Tech Utilities
- E. Visible Networks
  - 1. Networking Technologies
  - 2. Network Protocols, LANs, and WANs
  - 3. Network Organization
- F. Microprocessors
  - 1. CPU Core Components
  - 2. Memory
  - 3. Modern CPUs
  - 4. Selecting, Installing, and Troubleshooting CPUs
- G. RAM
  - 1. Understanding DRAM
  - 2. Types of RAM
  - 3. Working with RAM
  - 4. Troubleshooting RAM
- H. BIOS
  - 1. We Need to Talk
  - 2. BIOS
  - 3. CMOS
  - 4. Option ROM and Device Drivers
  - 5. Power-On Self Test (POST)
  - 6. Care and Feeding of BIOS and CMOS
- I. Motherboards
  - 1. How Motherboards Work
  - 2. Expansion Bus
  - 3. Upgrading and Installing Motherboards
  - 4. Troubleshooting Motherboards
- J. Power Supplies
  - 1. Understanding Electricity
  - 2. Powering the PC
  - 3. Installing and Maintaining Power Supplies
  - 4. Troubleshooting Power Supplies
- K. Hard Drive Technologies
  - 1. How Hard Drives Work
  - 2. Parallel and Serial ATA
  - 3. SCSI: Still Around
  - 4. Protecting Data with RAID
  - 5. Installing Drives
  - 6. BIOS Support: Configuring CMOS and Installing Drivers
  - 7. Troubleshooting Hard Drive Installation
- L. Implementing Hard Drives
  - 1. Hard Drive Partitions
  - 2. Hard Drive Formatting
  - 3. The Partitioning and Formatting Process
  - 4. Maintaining and Troubleshooting Hard Drives
- M. Removable Media
  - 1. Floppy Drives
  - 2. Flash Memory
  - 3. Optical Drives
  - 4. Troubleshooting Removable Drives
- N. Installing and Upgrading Windows
  - 1. Preparing for Installation or Upgrade
  - 2. The Installation and Upgrade Process
  - 3. Troubleshooting Installation Problems
  - 4. Post Installation Tasks
- O. Windows Under the Hood
  - 1. Registry
  - 2. The Boot Process
  - 3. Processes and Services and Threads, Oh My!
  - 4. Tools for Programmers
- P. NTFS, Users, and Groups
  - 1. Authentication with Users and Groups
  - 2. Authorization Through NTFS
  - 3. Sharing a Windows PC Securely
  - 4. User Account Control

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- Q. Maintaining and Optimizing Windows
  - 1. Maintaining Windows
  - 2. Optimizing Windows
  - 3. Preparing Windows for Problems
- R. Working with the Command-Line Interface
  - 1. Deciphering the Command-line Interface
  - 2. Mastering Fundamental Commands
  - 3. Working with Files
- S. Troubleshooting Windows
  - 1. Failure to Boot
  - 2. Failure to Load the GUI
  - 3. Application Problems
- T. Input Devices
  - 1. Support Common Ports
  - 2. Standard Input Devices
  - 3. Multimedia Devices
- U. Video
  - 1. Display Adapters
  - 2. Installing and Configuring Video
  - 3. Troubleshooting Video
- V. Local Area Networking
  - 1. Beyond Basic Ethernet Cabling
  - 2. TCP/IP
  - 3. Installing and Configuring a Wired Network
  - 4. Troubleshooting Networks
- W. Wireless Networking
  - 1. Wireless Networking Components
  - 2. Wireless Networking Standards
  - 3. Installing and Configuring Wireless Networking
  - 4. Troubleshooting Wi-Fi
- X. The Internet
  - 1. How the Internet Works
  - 2. Connecting to the Internet
  - 3. Internet Application Protocols
  - 4. Internet Troubleshooting
- Y. Multimedia
  - 1. Sound
  - 2. Video Capture
  - 3. TV Tuners
- Z. Portable Computing
  - 1. Portable Computing Devices
  - 2. Expanding Portable Computers
  - 3. Managing and Maintaining Portable Computers
  - 4. Upgrading and Repairing Laptop Computers
  - 5. Troubleshooting Portable Computers
- AA. Mobile Devices
  - 1. Features and Capabilities
  - 2. Configuration
  - 3. Security
- BB. Printers
  - 1. Printer Technologies
  - 2. The Laser Printing Process
  - 3. Installing a Printer in Windows

### **Grade Scale**

90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
0 – 59	F

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**Course Evaluation**

Final grades will be calculated according to the following criteria:

- |                 |     |
|-----------------|-----|
| 1. Labs         | 30% |
| 2. Study Guides | 10% |
| 3. Module Tests | 30% |
| 4. Final Exam   | 30% |

**Course Requirements**

1. Demonstrate proficiency through hands-on labs as assigned.
2. Complete Module Study Guides as assigned.

**Course Policies**

1. No food, drinks, or use of tobacco products in class.
2. Beepers, telephones, headphones, and any other electronic devices must be turned off while in class.
3. Do not bring children to class.
4. No late assignments will be accepted.
5. Certification. If a student passes the certification test that is associated with this class, you will receive an "A" on the final exam and credit for 25% of your labs. If you have missed a previous test, you must still take the final exam to substitute for that grade.
6. Attendance Policy. Three absences are allowed. If a student is tardy to class or departs early three (3) times, it will be equal to one (1) absence. Each absence beyond three absences will result in a 2 point deduction from your final grade.
7. If you wish to drop a course, the student is responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an 'F' in the course.
8. Labs. Due dates will be announced by the instructor.
9. Tools. Return all tools and/or software to their designated place.
10. A grade of 'C' or better must be earned in this course for credit toward degree requirement.
11. Additional class policies as defined by the individual course instructor.

**Disabilities Statement**

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please

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contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building.

**Course Schedule**

<b>Week of</b>	<b>Topic</b>	<b>Reference</b>
Week 1	Course introduction and policies The Path of the PC Tech Operational Procedures	<a href="https://cisco.netacad.net">https://cisco.netacad.net</a> pp. 1-19 pp. 20-39
Week 2	The Visible PC Visible Windows	pp. 40-63 pp. 64-123
Week 3	Visible Networks Microprocessors	pp. 124-155 pp. 156-197
Week 4	RAM BIOS	pp. 198-227 pp. 228-259
Week 5	Motherboards Power Supplies	pp. 260-299 pp. 300-329
Week 6	Hard Drive Technologies Implementing Hard Drives	pp. 330-373 pp. 374-427
Week 7	Removable Media Installing and Upgrading Windows	pp. 428-465 pp. 466-517
Week 8	Windows Under the Hood NTFS, Users, and Groups	pp. 518-553 pp. 554-595
Week 9	Maintaining and Optimizing Windows Working with the Command-Line Interface	pp. 596-641 pp. 642-679
Week 10	Troubleshooting Windows Input Devices	pp. 680-729 pp. 730-763
Week 11	Video Local Area Networking	pp. 764-821 pp. 822-869
Week 12	Wireless Networking The Internet	pp. 870-899 pp. 900-951
Week 13	Multimedia Portable Computing	pp. 952-985 pp. 986-1033
Week 14	Mobile Devices	pp. 1034-1057
Week 15	Printers	pp. 1058-1099

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<b>Week of</b>	<b>Topic</b>	<b>Reference</b>
Week 16	Final Exam	<a href="https://cisco.netacad.net">https://cisco.netacad.net</a>

**Contact Information:**

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**Additional Course Policies**

Additional policies may be determined by individual course instructors. These policies will be indicated in the syllabus that is issued at the start of the course.