

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.
 - a. ISBN: 978-0-07179-591-3
2. Computer Networking and Troubleshooting Technology students are required to have one portable external Hard Drive with a capacity of 500GB or larger to be used for the duration of the time to complete their respective degree.

Course Objectives

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

1. Describe the internal components of a computer.
2. Assemble a computer system.
3. Install an operating system.
4. Troubleshoot using system tools and diagnostic software.

Course Outline

1. The Path of the PC Tech
 - a. The Importance of Skill in Managing and Troubleshooting PCs
 - b. How Do I Become CompTIA A+ Certified?
2. Operational Procedures
 - a. The Professional Tech
 - b. Communication
 - c. Safety and Tools
3. The Visible PC
 - a. How the PC Works
 - b. The Art of the Technician
 - c. The Complete PC
 - d. Inside the System Unit
4. Visible Windows

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- a. A Brief History of Microsoft Windows
 - b. The Windows Interface
 - c. Operating System Folders
 - d. Tech Utilities
- 5. Visible Networks
 - a. Networking Technologies
 - b. Network Protocols, LANs, and WANs
 - c. Network Organization
- 6. Microprocessors
 - a. CPU Core Components
 - b. Memory
 - c. Modern CPUs
 - d. Selecting, Installing, and Troubleshooting CPUs
- 7. RAM
 - a. Understanding DRAM
 - b. Types of RAM
 - c. Working with RAM
 - d. Troubleshooting RAM
- 8. BIOS
 - a. We Need to Talk
 - b. BIOS
 - c. CMOS
 - d. Option ROM and Device Drivers
 - e. Power-On Self Test (POST)
 - f. Care and Feeding of BIOS and CMOS
- 9. Motherboards
 - a. How Motherboards Work
 - b. Expansion Bus
 - c. Upgrading and Installing Motherboards
 - d. Troubleshooting Motherboards
- 10. Power Supplies
 - a. Understanding Electricity
 - b. Powering the PC
 - c. Installing and Maintaining Power Supplies
 - d. Troubleshooting Power Supplies
- 11. Hard Drive Technologies
 - a. How Hard Drives Work
 - b. Parallel and Serial ATA
 - c. SCSI: Still Around
 - d. Protecting Data with RAID
 - e. Installing Drives

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- f. BIOS Support: Configuring CMOS and Installing Drivers
 - g. Troubleshooting Hard Drive Installation
- 12. Implementing Hard Drives
 - a. Hard Drive Partitions
 - b. Hard Drive Formatting
 - c. The Partitioning and Formatting Process
 - d. Maintaining and Troubleshooting Hard Drives
- 13. Removable Media
 - a. Floppy Drives
 - b. Flash Memory
 - c. Optical Drives
 - d. Troubleshooting Removable Drives
- 14. Installing and Upgrading Windows
 - a. Preparing for Installation or Upgrade
 - b. The Installation and Upgrade Process
 - c. Troubleshooting Installation Problems
 - d. Post Installation Tasks
- 15. Windows Under the Hood
 - a. Registry
 - b. The Boot Process
 - c. Processes and Services and Threads, Oh My!
 - d. Tools for Programmers
- 16. NTFS, Users, and Groups
 - a. Authentication with Users and Groups
 - b. Authorization Through NTFS
 - c. Sharing a Windows PC Securely
 - d. User Account Control
- 17. Maintaining and Optimizing Windows
 - a. Maintaining Windows
 - b. Optimizing Windows
 - c. Preparing Windows for Problems
- 18. Working with the Command-Line Interface
 - a. Deciphering the Command-line Interface
 - b. Mastering Fundamental Commands
 - c. Working with Files
- 19. Troubleshooting Windows
 - a. Failure to Boot
 - b. Failure to Load the GUI
 - c. Application Problems
- 20. Input Devices
 - a. Support Common Ports

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- b. Standard Input Devices
 - c. Multimedia Devices
- 21. Video
 - a. Display Adapters
 - b. Installing and Configuring Video
 - c. Troubleshooting Video
- 22. Local Area Networking
 - a. Beyond Basic Ethernet Cabling
 - b. TCP/IP
 - c. Installing and Configuring a Wired Network
 - d. Troubleshooting Networks
- 23. Wireless Networking
 - a. Wireless Networking Components
 - b. Wireless Networking Standards
 - c. Installing and Configuring Wireless Networking
 - d. Troubleshooting Wi-Fi
- 24. The Internet
 - a. How the Internet Works
 - b. Connecting to the Internet
 - c. Internet Application Protocols
 - d. Internet Troubleshooting
- 25. Multimedia
 - a. Sound
 - b. Video Capture
 - c. TV Tuners
- 26. Portable Computing
 - a. Portable Computing Devices
 - b. Expanding Portable Computers
 - c. Managing and Maintaining Portable Computers
 - d. Upgrading and Repairing Laptop Computers
 - e. Troubleshooting Portable Computers
- 27. Mobile Devices
 - a. Features and Capabilities
 - b. Configuration
 - c. Security
- 28. Printers
 - a. Printer Technologies
 - b. The Laser Printing Process
 - c. Installing a Printer in Windows

Grade Scale

90 – 100 A

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

Course Evaluation

Final grades will be calculated according to the following criteria:

Labs	30%
Study Guides	10%
Chapter Tests	30%
Final Exam	30%

Course Requirements

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

Course Policies

1. No food, drinks, or use of tobacco products in class.
2. Electronic devices not being used for the class, such as phones and headphones, must be turned off while in class.
3. Do not bring children to class.
4. 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.
5. 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.
6. 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.
7. Tools: Return all tools and/or software to their designated place.
8. A grade of ‘C’ or better must be earned in this course for credit toward degree requirement.
9. Additional course policies, as defined by the individual course instructor, will be outlined in the course addendum and provided by the 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

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

Technical Requirements (for courses using Blackboard)

The latest technical requirements, including hardware, compatible browsers, operating systems, software, Java, etc. can be found online at:

[https://help.blackboard.com/en-us/Learn/9.1 2014 04/Student/015 Browser Support/015 Browser Support Policy](https://help.blackboard.com/en-us/Learn/9.1%2014%2004/Student/015%20Browser%20Support/015%20Browser%20Support%20Policy)

A functional broadband internet connection, such as DSL, cable, or WiFi is necessary to maximize the use of the online technology and resources.

Student Code of Conduct Statement

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the LIT Catalog and Student Handbook. The LIT Catalog and Student Handbook may be accessed at www.lit.edu or obtained in print upon request at the Student Services Office. Please note that the online version of the LIT Catalog and Student Handbook supersedes all other versions of the same document.

Certification Requirement

CNTT majors are required to earn certification in one of the following areas prior to graduation.

- A+ Certification
- Cisco Certified Entry Network Technician (CCENT)
- Cisco Certified Network Associate (CCNA)
- Microsoft Certified Solutions Associate (MCSA)

This course covers the material to prepare for CompTIA's A+ certification, exam numbers 220-901 and 220-902. Students are responsible for scheduling and paying for the certification through the LIT Testing Center. More information about the certification can be found online at <https://certification.comptia.org/certifications/a>.

Course Schedule

Week of	Topic	Reference
Week 1	Course introduction and policies	
	The Path of the PC Tech	pp. 1-19
	Operational Procedures	pp. 20-39
Week 2	The Visible PC	pp. 40-63
	Visible Windows	pp. 64-123
Week 3	Visible Networks	pp. 124-155

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Week of	Topic	Reference
	Microprocessors	pp. 156-197
Week 4	RAM	pp. 198-227
	BIOS	pp. 228-259
Week 5	Motherboards	pp. 260-299
	Power Supplies	pp. 300-329
Week 6	Hard Drive Technologies	pp. 330-373
	Implementing Hard Drives	pp. 374-427
Week 7	Removable Media	pp. 428-465
	Installing and Upgrading Windows	pp. 466-517
Week 8	Windows Under the Hood	pp. 518-553
	NTFS, Users, and Groups	pp. 554-595
Week 9	Maintaining and Optimizing Windows	pp. 596-641
	Working with the Command-Line Interface	pp. 642-679
Week 10	Troubleshooting Windows	pp. 680-729
	Input Devices	pp. 730-763
Week 11	Video	pp. 764-821
	Local Area Networking	pp. 822-869
Week 12	Wireless Networking	pp. 870-899
	The Internet	pp. 900-951
Week 13	Multimedia	pp. 952-985
	Portable Computing	pp. 986-1033
Week 14	Mobile Devices	pp. 1034-1057
Week 15	Printers	pp. 1058-1099
Week 16	Final Exam	

Contact Information:

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