IT Essentials: PC Hardware and Software (CPMT 1311)

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
CENGAGE LEARNING, 2019.
ISBN: 9780357440780

Course Objectives (with applicable SCANS skills after each)
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. The three-part foundation skills and five-part workplace competences are further defined in the SCANS attachment.
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  

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>A</td>
<td>90 – 100</td>
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<td>B</td>
<td>80 – 89</td>
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<tr>
<td>C</td>
<td>70 – 79</td>
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<td>D</td>
<td>60 – 69</td>
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<tr>
<td>F</td>
<td>0 – 59</td>
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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 contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building.

**Course Schedule**

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<th>Week of</th>
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<td>Week 1</td>
<td>Course introduction and policies</td>
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<td></td>
<td>The Path of the PC Tech</td>
<td>pp. 20-39</td>
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<td>Operational Procedures</td>
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<td>Week 2</td>
<td>The Visible PC</td>
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<td>Visible Windows</td>
<td>pp. 64-123</td>
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<td>Week 3</td>
<td>Visible Networks</td>
<td>pp. 124-155</td>
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<td>Microprocessors</td>
<td>pp. 156-197</td>
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<td>Week 4</td>
<td>RAM</td>
<td>pp. 198-227</td>
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<td>BIOS</td>
<td>pp. 228-259</td>
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<td>Week 5</td>
<td>Motherboards</td>
<td>pp. 260-299</td>
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<td>Power Supplies</td>
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<td>Week 6</td>
<td>Hard Drive Technologies</td>
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<td>Implementing Hard Drives</td>
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<td>Week 7</td>
<td>Removable Media</td>
<td>pp. 428-465</td>
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<td>Installing and Upgrading Windows</td>
<td>pp. 466-517</td>
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<td>Week 8</td>
<td>Windows Under the Hood</td>
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<td>NTFS, Users, and Groups</td>
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<td>Week 9</td>
<td>Maintaining and Optimizing Windows</td>
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<td>Working with the Command-Line Interface</td>
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<td>Week 10</td>
<td>Troubleshooting Windows</td>
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<td>Input Devices</td>
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<td>Video</td>
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<td>Local Area Networking</td>
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<td>Week 12</td>
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<td>The Internet</td>
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<td>Week 13</td>
<td>Multimedia</td>
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<td>Portable Computing</td>
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<td>Week 14</td>
<td>Mobile Devices</td>
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Course Syllabi

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<tr>
<td>Week 15</td>
<td>Printers</td>
<td>pp. 1058-1099</td>
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<td>Week 16</td>
<td>Final Exam</td>
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Contact Information:

Instructor: Tim Storbeck
Computer Networking and Troubleshooting Technology

Office: Office 103B, TA-4

Telephone: (409) 839-2076

E-mail: tjstorbecklit.edu

Office hours: Posted outside office

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.