



El Camino College
COURSE OUTLINE OF RECORD – Official

Course Acronym:	ECHT
Course Number:	144
Descriptive Title:	CompTIA A+ Computer Hardware Systems
Division:	Industry and Technology
Department:	Electronics and Computer Hardware Technology
Course Disciplines:	Electronic Technology, Electronics
Catalog Description:	<p>This course is designed for the student pursuing a career as a computer service technician. Students will develop the skills and knowledge required for passing the CompTIA A+ Certification Core Hardware exam. Topics covered include safety, basics of electricity and electronics, micro-computer hardware and components, Complementary Metal Oxide Semiconductor (CMOS) settings, printers, portable systems and network hardware.</p> <p>Note: Letter grade or pass/no pass option.</p>
Prerequisite:	
Co-requisite:	
Recommended Preparation:	Electronics and Computer Hardware Technology 140
Enrollment Limitation:	
Hours Lecture (per week):	2
Hours Laboratory (per week):	4
Outside Study Hours:	4
Total Course Hours:	108
Course Units:	3
Grading Method:	Letter Grade and Pass/No Pass
Credit Status:	Credit, degree applicable
Transfer CSU:	Yes
Effective Date:	03/18/2002
Transfer UC:	No
Effective Date:	
General Education: ECC	
Term:	

	Other:
	CSU GE:
	Term:
	Other:
	IGETC:
	Term:
	Other:
Student Learning Outcomes:	<p>SLO #1 Course Notebook</p> <p>The students will assemble and maintain a five-section course notebook.</p> <p>SLO #2 CompTIA Industry Certification</p> <p>The student will acquire a knowledge base to prepare to take the A+ Certification Exam through CompTIA, an industry recognized certification.</p> <p>SLO #3 Electricity & Electronics</p> <p>The student will acquire a knowledge in safety and the basics of electricity and electronics, micro-computer hardware and components.</p>
Course Objectives:	<ol style="list-style-type: none"> 1. Analyze proper procedures for installing and configuring system components and devices. 2. Diagnose and troubleshoot computer system problems and determine whether they are hardware or software related. 3. Identify safety procedures, environmental hazards and preventative maintenance techniques. 4. Compare and contrast popular motherboards, types of memory, bus architectures and peripheral devices. 5. Evaluate the print process and identify procedures for servicing printers. 6. Identify the unique components of portable systems. 7. Define basic networking concepts and networking hardware components. 8. Configure a computer to function on a network. 9. Differentiate between effective and ineffective behaviors related to customer satisfaction.
Major Topics:	<p>I. OVERVIEW OF COMPTIA A+ CERTIFICATION (1 hour, lecture)</p> <p>A. Scope of course B. History of computers and Personal Computer (PC) systems</p> <p>II. OVERVIEW OF COMPTIA A+ CERTIFICATION (4 hours, lab)</p> <p>A. Scope of course B. History of computers and PC systems</p> <p>III. INTRODUCING HARDWARE AND SOFTWARE (2 hours, lecture)</p> <p>A. PC hardware components B. Operating systems past and present</p>

IV. INTRODUCING HARDWARE AND SOFTWARE (4 hours, lab)

- A. PC hardware components
- B. Operating systems past and present

V. SAFETY, TOOLS AND ELECTRICITY (2 hours, lecture)

- A. PC support technician tools
- B. PC preventive maintenance tools
- C. How to work inside a computer case
- D. Measures and properties of electricity
- E. Energy Star systems (The Green PC)

VI. SAFETY, TOOLS AND ELECTRICITY (4 hours, lab)

- A. PC support technician tools
- B. PC preventive maintenance tools
- C. How to work inside a computer case
- D. Measures and properties of electricity
- E. Energy Star systems (The Green PC)

VII. SYSTEM CASES AND POWER SUPPLIES / POWER-ON SELF TEST (POST), BASIC INPUT/OUTPUT SYSTEM (BIOS), AND COMPUTER MINIMUM OPERATING SYSTEM (CMOS) SETTINGS (4 hours, lecture)

- A. System cases and power supplies
 - 1. System cases, motherboard and power supply form factors
 - 2. Protecting your computer system
 - 3. Troubleshooting the electrical system
- B. POST, BIOS and CMOS settings
 - 1. POST
 - 2. BIOS
 - 3. Configuring the CMOS settings

VIII. SYSTEM CASES AND POWER SUPPLIES / POST, BIOS AND CMOS SETTINGS (8 hours, lab)

- A. System cases and power supplies
 - 1. System cases, motherboard and power supply form factors
 - 2. Protecting your computer system
 - 3. Troubleshooting the electrical system
- B. POST, BIOS and CMOS settings
 - 1. POST
 - 2. BIOS
 - 3. Configuring the CMOS settings

IX. CENTRAL PROCESSING UNITS AND SYSTEM BOARDS AND MEMORY (4 hours, lecture)

- A. Central processing units
 - 1. Processors past and present
 - 2. The Intel processors

3. How choose the right processor

B. System boards and memory

1. Selecting a motherboard
2. Configuring and supporting a motherboard
3. Selecting the right type of memory

X. CENTRAL PROCESSING UNITS AND SYSTEM BOARDS AND MEMORY (8 hours, lab)

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1. Processors past and present
2. The Intel processors
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XI. BUS ARCHITECTURES AND PLUG AND PLAY DEVICES / PORTS, CONNECTORS AND CABLES (4 hours, lecture)

A. Bus architectures and plug and play devices

1. Buses and expansion slots
2. On-board ports, connectors and riser slots

B. Ports, connectors and cables

1. Serial and parallel ports
2. Universal Serial Bus (USB) and FireWire ports
3. Ribbon cables for the PC

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1. Serial and parallel ports
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XIII. DRIVE CONTROLLERS AND EXPANSION BOARDS / STORAGE AND BACKUP SYSTEMS (4 hours, lecture)

A. Drive controllers and expansion boards

1. On-board motherboard controllers
2. Expansion board controllers

B. Storage and backup systems

1. Hard drives
2. Optical and tape backup systems

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 - 1. Hard drives
 - 2. Optical and tape backup systems

**XV. PRINTERS AND THE PRINT PROCESS / PORTABLE SYSTEMS
AND POWER MANAGEMENT (4 hours, lecture)**

- A. Printers and the print process
 - 1. How printers work
 - 2. Installing and configuring printers
 - 3. Printer maintainable and troubleshooting
- B. Portable systems and power management
 - 1. Supporting notebooks
 - 2. Configuring power management settings

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**XVII. NETWORKING CONCEPTS AND CONNECTIVITY / CUSTOMER
SATISFACTION AND COMMUNICATIONS (8 hours, lecture)**

- A. Networking concepts and connectivity
 - 1. Physical network architectures
 - 2. Installing a Network Interface Card (NIC) and connecting to a network
 - 3. Using resources on the network
- B. Customer satisfaction and communications
 - 1. The professional PC technician
 - 2. Job roles and responsibilities
 - 3. Providing good customer service

**XVIII. NETWORKING CONCEPTS AND CONNECTIVITY / CUSTOMER
SATISFACTION AND COMMUNICATIONS (8 hours, lab)**

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- B. Customer satisfaction and communications
 - 1. The professional PC technician

	<p>2. Job roles and responsibilities 3. Providing good customer service</p> <p>XIX. SEMESTER PROJECT DEVELOPMENT (3 hours, lecture)</p> <p>A. Critical analysis B. Individual and group discussion C. Outlining template for term project</p> <p>XX. SEMESTER PROJECT DEVELOPMENT (12 hours, lab)</p> <p>A. Critical analysis B. Individual and group discussion C. Presentation of term project</p>
Total Lecture Hours:	36
Total Laboratory Hours:	72
Total Hours:	108
Primary Method of Evaluation:	2) Problem solving demonstrations (computational or non-computational)
Typical Assignment Using Primary Method of Evaluation:	After replacing a system board in a customer's computer, the computer will not boot. On a lab report, document three possible power-related problems that could cause the system's failure to boot. Submit lab report to the instructor.
Critical Thinking Assignment 1:	Given a computer with a dead CMOS battery, install a new battery, enter the proper CMOS settings and test the system for proper performance. Report findings on a two-page lab report and submit to the instructor.
Critical Thinking Assignment 2:	A customer-installed modem is not working properly. Diagnose the fault and configure the modem for proper operation. Consult the instructor for evaluation.
Other Evaluation Methods:	<p>Performance Exams Objective Exams Other Exams Quizzes Written Homework Laboratory Reports Class Performance Homework Problems Term or Other Papers Multiple Choice Completion Matching Items True/False Other (specify): Computer System Design Research Assignment Presentation</p>
Instructional Methods:	<p>Demonstration Discussion Group Activities Guest Speakers Laboratory Lecture Multimedia Presentations</p>

	Other (please specify): Computer Based Training (DVD-ROM software for enhanced student training)
If other:	
Work Outside of Class:	Study Answer questions Skill practice Required reading Problem solving activities Written work
If Other:	
Up-To-Date Representative Textbooks:	Jean Andrews, Joy Dark Shelton and Nicholas Pierce, <u>CompTIA A+ Guide to IT Technical Support</u> , 11 th edition, Pearson Education, 2023 Michael Covington and Douglas Downing, <u>DICTIONARY OF COMPUTER AND INTERNET TERMS</u> , 11th edition, 2017 (Discipline Standard)
Alternative Textbooks:	
Required Supplementary Readings:	
Other Required Materials:	Compact Disk Read Only Memory (CD-ROM) Digital Versatile Disc-Read Only Memory (DVD-ROM) 1 USB Flash Drive of at least 8GB of storage 1 - 3 Ring Binder - 1 1/2" hard cover
Requisite:	
Category:	
Requisite course(s): List both prerequisites and corequisites in this box.	
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	
Requisite Skill:	
Requisite Skill and Matching Skill(s): Bold the requisite skill(s). If applicable	
Requisite course:	Electronics and Computer Hardware Technology 140
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course	Understand computer system design and operational concepts. ECHT 140 -Understand the operating principals of computer system hardware. Understand analog and digital concepts involving computer systems.

objective under each skill(s).	<p>ECHT 140 - Understand the operating principals of computer system hardware.</p> <p>Assemble and disassemble personal computer systems and install operating system software.</p> <p>ECHT 140 - Assemble and disassemble computer systems using industry standard techniques and safety procedures.</p>
Requisite Skill:	
Requisite Skill and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s). If applicable	
Enrollment Limitations and Category:	
Enrollment Limitations Impact:	
Course Created by:	Osanne Ugya
Date:	09/01/1989
Original Board Approval Date:	03/12/1990
Last Reviewed and/or Revised by:	Paul Akhigbe
Date:	01/05/2023
Last Board Approval Date:	07/17/2023 effective FALL 2024