



El Camino College
COURSE OUTLINE OF RECORD – Approved

I. GENERAL COURSE INFORMATION

Subject and Number: Electronics and Computer Hardware Technology 140
Descriptive Title: Computer Systems and Hardware Technologies I
Course Disciplines: Electronics AND Electronic Technology
Division: Industry and Technology

Catalog Description:

This course provides a general study of computer hardware systems and their underlying operating technologies. Topics covered include an overview of microprocessor-based computer systems, binary and hexadecimal numbering systems, computer system hardware components and peripherals, operating systems, basic hardware failures, and test and verification of proper computer systems operation. Students work in teams to develop analytical skills and techniques.

Note: Letter grade or pass/no pass option.

Conditions of Enrollment:

Recommended Preparation: Electronics and Computer Hardware 11 and Computer Information Systems 13 or equivalent

Course Length:	X Full Term	Other (Specify number of weeks):
Hours Lecture:	2.00 hours per week	TBA
Hours Laboratory:	4.00 hours per week	TBA
Course Units:	3.00	

Grading Method: Both
Credit Status: Associate Degree Credit

Transfer CSU: X Effective Date: 3/12/1990
Transfer UC: No

General Education:
El Camino College:

CSU GE:

IGETC:

II. OUTCOMES AND OBJECTIVES

A. COURSE STUDENT LEARNING OUTCOMES (The course student learning outcomes are listed below, along with a representative assessment method for each. Student learning outcomes are not subject to review, revision or approval by the College Curriculum Committee)

SLO #1 Course Notebook The students will assemble and maintain a five-section course notebook.

SLO #2 Component Handling Techniques The student will be able to demonstrate their knowledge in proper component handling techniques, especially regarding (ESD), Electrostatic Discharge.

SLO #3 Computer Estimate and Configuration The student will be able to demonstrate their ability to cost out and configure either a Business or "Gaming" Computer per customer specifications.

The above SLOs were the most recent available SLOs at the time of course review. For the most current SLO statements, visit the El Camino College SLO webpage at <http://www.elcamino.edu/academics/slo/>.

B. Course Student Learning Objectives (The major learning objective for students enrolled in this course are listed below, along with a representative assessment method for each)

1. Identify basic computer hardware components and peripherals.
 - Objective Exams
2. Understand the operating principals of computersystem hardware.
 - Objective Exams
3. Assemble and disassemblecomputersystemsusingindustrystandard techniques and safety procedures.
 - Class Performance
4. Install hardware expansion cards and peripheral components.
 - Class Performance
5. Install and configure standard fixed disks and drives.
 - Class Performance
6. Install current operating systems for microprocessor-based computer systems.
 - Class Performance
7. Verify the proper operation of a computer system using observation techniques and diagnostic skills.
 - Laboratory reports
8. Employ diagnostic software to test and check computer system hardware and software integrity and functionality.
 - Laboratory reports

III. OUTLINE OF SUBJECT MATTER (Topics are detailed enough to enable a qualified instructor to determine the major areas that should be covered as well as ensure consistency from instructor to instructor and semester to semester.)

Lecture or Lab	Approximate Hours	Topic Number	Major Topic
Lecture	3	I	COMPUTER HARDWARE TECHNOLOGY OVERVIEW A. History of computer and personal computer systems B. Binary and hexadecimal numbers
Lab	8	II	BINARY, DECIMAL AND HEXADECIMAL NUMBERS A. Binary to decimal conversions B. Decimal to hexadecimal conversions C. Binary to hexadecimal conversions
Lecture	6	III	COMPUTER HARDWARE SYSTEMS COMPONENT IDENTIFICATION AND OPERATION PRINCIPALS A. Identification of basic computer hardware components and peripherals B. Understand the operating principals of computer system hardware components and peripherals
Lab	16	IV	COMPUTER HARDWARE SYSTEMS COMPONENT IDENTIFICATION AND OPERATION PRINCIPALS A. Identification of basic computer hardware components and peripherals B. Understand the operating principals of computer system hardware components and peripherals
Lecture	6	V	COMMAND LINE INTERFACE FOR COMPUTER SYSTEMS A. Installation and configuration of current command line operating systems B. Use of common commands and utilities, related to hardware configuration
Lab	8	VI	COMMAND LINE INTERFACE FOR COMPUTER SYSTEMS A. Installation and configuration of current command line operating systems B. Use of common commands and utilities, related to hardware configuration
Lecture	12	VII	HARDWARE INSTALLATION AND CONFIGURATION FOR COMPUTER SYSTEMS A. Analysis of system hardware components B. Assembly and disassembly of computer hardware systems components C. Testing and observation of computer systems and peripherals D. Verifying proper operation by using diagnostic testing software

Lab	20	VIII	<p>HARDWARE INSTALLATION AND CONFIGURATION FOR COMPUTER SYSTEMS</p> <ul style="list-style-type: none"> A. Analysis of system hardware components B. Assembly and disassembly of computer hardware systems components C. Testing and observation of computer systems and peripherals D. Verifying proper operation by using diagnostic testing software
Lecture	6	IX	<p>GRAPHICAL USER INTERFACE (GUI) FUNDAMENTALS FOR COMPUTERS SYSTEMS</p> <ul style="list-style-type: none"> A. Installation and configuration of current GUI operating systems B. Use of common commands and utilities, related to hardware configuration C. Installation and operation of diagnostic applications within the GUI environment
Lab	8	X	<p>GUI FUNDAMENTALS FOR COMPUTERS SYSTEMS</p> <ul style="list-style-type: none"> A. Installation and configuration of current GUI operating systems B. Use of common commands and utilities, related to hardware configuration C. Installation and operation of diagnostic applications within the GUI environment
Lecture	3	XI	<p>SEMESTER PROJECT DEVELOPMENT</p> <ul style="list-style-type: none"> A. Critical analysis B. Individual and group discussion C. Outlining template for term project
Lab	12	XII	<p>SEMESTER PROJECT DEVELOPMENT</p> <ul style="list-style-type: none"> A. Critical analysis B. Individual and group discussion C. Presentation of term project
Total Lecture Hours		36	
Total Laboratory Hours		72	
Total Hours		108	

IV. PRIMARY METHOD OF EVALUATION AND SAMPLE ASSIGNMENTS

A. PRIMARY METHOD OF EVALUATION:

Problem solving demonstrations (computational or non-computational)

B. TYPICAL ASSIGNMENT USING PRIMARY METHOD OF EVALUATION:

Provided with a computer system with a non-functioning CD-ROM drive, replace the faulty CD-ROM drive and verify proper operation of the repaired computer system. Consult the instructor for evaluation.

C. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:

1. Integrate a set of computer hardware components and peripherals into a functioning computer system. Consult the instructor for evaluation.
2. Provided with a computer system with a suspected hardware failure, determine if a hardware failure exists and write a one-page lab report listing the logical steps required for resolving the hardware failure. Submit lab report to the instructor.

D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:

Performance exams
Objective Exams
Quizzes
Written homework
Laboratory reports
Class Performance
Homework Problems
Term or other papers
Multiple Choice
Completion
Matching Items
True/False
Other (specify): Computer Hardware System Design Research Assignment
Presentation

V. INSTRUCTIONAL METHODS

Demonstration
Discussion
Group Activities
Guest Speakers
Laboratory
Lecture
Multimedia presentations
Other (please specify)
Computer Based Training (DVD-ROM software for enhanced student training)

Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instruction delivery shall provide access, full inclusion, and effective communication for students with disabilities.

VI. WORK OUTSIDE OF CLASS

Study
Answer questions
Skill practice
Required reading
Problem solving activities

Estimated Independent Study Hours per Week: 4

VII. TEXTS AND MATERIALS

A. UP-TO-DATE REPRESENTATIVE TEXTBOOKS

Michael Covington and Douglas Downing, DICTIONARY OF COMPUTER AND INTERNET TERMS 11th ed, BARRON, 2013 - INDUSTRY STANDARD

Scott Mueller, UPGRADING AND REPAIRING PC'S, 22nd ed, PEARSON/QUE, 2015

Cheryl Schmidt. COMPLETE COMPTIA A+ GUIDE TO HARDWARE, 7TH edition, Pearson, 2016

B. ALTERNATIVE TEXTBOOKS

C. REQUIRED SUPPLEMENTARY READINGS

D. OTHER REQUIRED MATERIALS

2 Blank CD-RW disks

4 Blank DVD-RW disks

1 USB Flash Drive of at least 2GB of storage

1 - 3 Ring Binder - 1 1/2" hard cover

VIII. CONDITIONS OF ENROLLMENT

A. Requisites (Course and Non-Course Prerequisites and Corequisites)

Requisites	Category and Justification
------------	----------------------------

B. Requisite Skills

Requisite Skills

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation	Category and Justification
Course Recommended Preparation AND Electronics and Computer Hardware Technology-11	
Course Recommended Preparation or Computer Information Systems-13	
Non-Course Recommended Preparation Equivalent	If students have not taken ECHT 11 or CIS 13 but have taken similar courses at another college or have understanding of electronic circuitry and computer applica- tions through work experience, students will have the skills needed to take this course. If students do not have some form of basic knowledge of electronic circuitry and computer applications, students may not succeed in this class.

D. Recommended Skills

Recommended Skills
Ability to connect to circuits. ECHT 11 - Connect meters to circuits, select proper meter ranges and obtain accurate measurements.
ECHT 11 - Identify employment options and be aware of the preparation necessary for success.
Ability to understand the use of information technology and applications. CIS 13 - Identify and analyze existing and emerging technologies and their impact on organizations and society including computer, communication and information systems, privacy, security, crime, ethics, global relationships, and career opportunities.

E. Enrollment Limitations

Enrollment Limitations and Category	Enrollment Limitations Impact
-------------------------------------	-------------------------------

Course created by Osanne Ugya on 09/01/1989.

BOARD APPROVAL DATE: 03/12/1990

LAST BOARD APPROVAL DATE: 06/19/2017

Last Reviewed and/or Revised by STEVE COCCA

Date: March 5, 2019

19868