ELEC 88 Course Outline as of Fall 2013

CATALOG INFORMATION

Dept and Nbr: ELEC 88   Title: COMPUTER HARDWARE
Full Title: Computer Hardware
Last Reviewed: 4/22/2019

Units			Course Hours per Week		Nbr of Weeks	Course Hours Total		
Maximum	3.00		Lecture Scheduled	2.50	17.5	Lecture Scheduled		43.75
Minimum	3.00		Lab Scheduled	1.50	8	Lab Scheduled		26.25
			Contact DHR	0		Contact DHR		0
			Contact Total	4.00		Contact Total		70.00
			Non-contact DHR	0		Non-contact DHR		0

Total Out of Class Hours: 87.50   Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable
Grading: Grade or P/NP
Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:
Formerly:

Catalog Description:
Fundamentals of computer hardware repair and basic diagnostic tests. Emphasis on general computer operation and maintenance including a unit on laptops. Includes complete disassembly and reassembly of a PC (Personal Computer) by each student. (Lecture/Lab)

Prerequisites/Corequisites:

Recommended Preparation:
Course Completion or Concurrent Enrollment in CS 101B

Limits on Enrollment:

Schedule of Classes Information:
Description: Fundamentals of computer hardware repair and basic diagnostic tests. Emphasis on general computer operation and maintenance including a unit on laptops. Includes complete disassembly and reassembly of a PC (Personal Computer) by each student. (Lecture/Lab) (Grade or P/NP)
Prerequisites/Corequisites:
Recommended: Course Completion or Concurrent Enrollment in CS 101B

Limits on Enrollment:
Transfer Credit: CSU;
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**		Effective:	Inactive:
CSU GE:	**Transfer Area**		Effective:	Inactive:
IGETC:	**Transfer Area**		Effective:	Inactive:
CSU Transfer:	Transferable	Effective:	Fall 2013	Inactive:
UC Transfer:		Effective:		Inactive:

CID:

Certificate/Major Applicable:
Not Certificate/Major Applicable

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Upgrade and install personal computer (PC) components
2. Maintain laptop components
3. Troubleshoot and repair system components
4. Completely disassemble and reassemble a PC

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

1. Apply appropriate safety procedures while working on systems.
2. Inspect and evaluate the input, processing, and output functions of a personal computer (PC).
3. Remove and replace PC components.
4. Identify motherboard components and classify by their type and function.
5. Identify networking systems and devices.
6. Identify laptop systems and devices.
7. Perform mathematical conversions between binary, octal, and hexadecimal numbers.
8. Perform basic electrical measurements.
9. Upgrade random access memory (RAM).
10. Inspect and evaluate individual peripheral devices.
11. Evaluate the operation of the computer, utilizing diagnostic tests.
12. Partition and format a hard drive.
13. Perform a clean installation of an operating system (OS).
14. Perform system component troubleshooting and repair.
15. Disassemble and reassemble PC.

Topics and Scope:

I. PC Overview

A. structure of the PC system
B. motherboard and subsystems
C. memory and addresses
D. mass storage
E. computer language levels

II. Number Systems
A. conversions
B. metric prefixes

III. PC Operations
A. basic parts of the PC
B. PC bus structure
C. input and output
D. power supply

IV. Electrical Units and Measurement
A. Volt, Ohm, Ampere, Watt
B. engineering prefix notation
C. correct use of test equipment to measure voltage

V. Troubleshooting and Repair
A. start-up problems
B. run problems
C. display problems
D. component failures
E. safety precautions during troubleshooting and repairs

VI. Routine Preventive Maintenance
A. contributors to system failure
B. virus protection
C. data protection
D. hard drive maintenance

VII. Upgrades, Installation and Troubleshooting
A. Random access memory (RAM)
B. Hard drives
C. Multimedia and mass storage

VIII. Supporting Windows OS
A. clean install of an OS
B. configuration
C. troubleshooting

IX. Supporting Input/Output (I/O) Devices
A. installation
B. configuration
C. troubleshooting

X. Network Structure
A. basic network components
B. networking interconnect devices

XI. Supporting Laptops
A. maintaining laptop components
B. replacing and upgrading internal parts
C. troubleshooting laptops

XII. COMPTIA A+ Certification
A. test resources
B. process for earning certification

XIII. Laboratory Assignments
A. laboratory safety

      i. static electricity
     ii. using meters
  B. using software tools to examine a PC
  C. collecting hardware drivers
  D. measuring power supply voltages
  E. using machine code to program a microprocessor
  F. upgrading RAM
  G. supporting hard drives
  H. clean installation of an OS
  I. I/O devices and multimedia
  J. basic networking
  K. laptop overview
  L. disassemble and reassemble a PC

Assignment:

1. written repair log reports, 1-3 pages in length (4-6)
2. homework problem sets (8-12)
3. laboratory assignments (4-10)
4. quizzes (2-4) and one final exam

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Repair log reports	Writing 10 - 20%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems from text and course	Problem solving 15 - 25%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Laboratory assignments	Skill Demonstrations 15 - 25%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, true/false, matching items, completion	Exams 40 - 50%

Other: Includes any assessment tools that do not logically fit into the above categories.

Class participation	Other Category 5 - 10%

Representative Textbooks and Materials:
 A+ Guide to Managing and Maintaining Your PC, Seventh Edition, by Jean Andrews, 2011,
Course Technology, Cengage Learning.