ELEC 88 Course Outline as of Fall 2020

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 personal computer (PC) by each student.

Prerequisites/Corequisites:

Recommended Preparation:

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 personal computer (PC) by each student. (Grade or P/NP)
Prerequisites/Corequisites:
Recommended:
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:
Both Certificate and 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:
At the conclusion of this course, the student should be able to:
1. Apply appropriate safety procedures while working on systems.
2. Inspect and evaluate the input, processing, and output functions of a 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 a 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 Topics
A. Laboratory safety
1. static electricity
2. using meters

B. Using software tools to examine a PC
C. Collecting hardware drivers
D. Measuring power supply voltages
E. Upgrading RAM
F. Supporting hard drives
G. Clean installation of an OS
H. I/O devices and multimedia
I. Basic networking
J. Laptop overview
K. Disassemble and reassemble a PC

Assignment:

Lecture-Related Assignments:
1. Written repair log reports, 1-3 pages in length (4-6)
2. Homework problem sets (8-12)
3. Quizzes (2-4)
4. Final exam

Lab-Related Assignments:
1. Laboratory assignments (4-10)
2. Lab practicum

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	Problem solving 15 - 25%

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

Laboratory assignments and final lab practicum	Skill Demonstrations 25 - 40%

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

Quizzes and final exam	Exams 25 - 40%

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 IT Technical Support (Hardware and Software). 9th ed. Andrews, Jean. Cengage Learning. 2017