

Course Outline

COURSE: CSIS 181 **DIVISION:** 50 **ALSO LISTED AS:**

TERM EFFECTIVE: Spring 2016 **CURRICULUM APPROVAL DATE:** 10/26/2015

SHORT TITLE: PC HARDWARE

LONG TITLE: PC Hardware

<u>Units</u>	<u>Number of Weeks</u>	<u>Type</u>	<u>Contact Hours/Week</u>	<u>Total Contact Hours</u>
4	18	Lecture:	4	72
		Lab:	0	0
		Other:	0	0
		Total:	4	72

COURSE DESCRIPTION:

This course examines computing hardware, operating systems, and software applications from a technical side to enable students to select, install, maintain and optimize a computer system. This course will help prepare students to pursue the A+ Hardware Certification. This course has the option of a letter grade or pass/no pass. **ADVISORY:** CSIS 124, CSIS 1 OR CSIS 2, or equivalent computer experience.

PREREQUISITES:

COREQUISITES:

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES

L - Standard Letter Grade

P - Pass/No Pass

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:

02 - Lecture and/or discussion

05 - Hybrid

72 - Dist. Ed Internet Delayed

STUDENT LEARNING OUTCOMES:

1. Describe how a computer works in general terms

Measure: Written exams, demonstration

PLO: 1, 2

ILO: 1,2,3,7

GE-LO:

Year assessed or anticipated year of assessment: 2014

2. Analyze computer operating problems

Measure: exams, homework

PLO: 2

ILO: 1,2,3,7

GE-LO:

Year assessed or anticipated year of assessment: 2014

3. Use troubleshooting tools to diagnose and repair computers

Measure: exams, homework

PLO: 2

ILO: 1,2,3,7

GE-LO:

Year assessed or anticipated year of assessment: 2014

4. Assemble a computer using components

Measure: exams, homework

PLO: 1,2

ILO: 1,2,3,7

GE-LO:

Year assessed or anticipated year of assessment: 2014

PROGRAM LEARNING OUTCOMES:

1. Student will demonstrate entry-level skills and knowledge of the networking profession
2. Students will be eligible to take the industry A+ hardware exam.

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS

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(4 Hours) How computers work, hardware, software.

Hardware used for input and output.

Components used primarily for processing.

Temporary and permanent storage.

Interface cards. Electrical systems.

Three types of software and what they do.

Observing the boot process and hardware components.

Using the Internet for research.

Using Microsoft diagnostics with windows.

Using device manager.

Use shareware to examine a computer.

Student Performance Objectives:

Student will describe the functions performed by different hardware components of a microcomputer; about the three kinds of software and how they relate to one another and to hardware; and how the CPU uses primary and secondary storage to manage software.

(8 Hours) How software and hardware works together

The boot process
How software manages hardware resources
Protecting data, software, and hardware.
System resources defined.
Memory addresses.
Input/output addresses.
Direct memory access channels.
Saving and restoring setup information in CMOS.
Backing up your hard drive.
Documentation.
Types of system boards.
The system clock.
The CPU and the chip set, relating CPU attributes to bus architecture.
ROM BIOS, plug and play BIOS, flash ROM.
RAM, dynamic memory, static cache memory.
Buses and expansion slots
Bus evolution, what a bus does
Setting the CPU and bus speeds.
Hardware configuration, setup stored on a CMOS chip.
Safety precautions.
Protect against electricity.
Restoring and saving the CMOS settings.
Using a system board diagnostic utility.
Print a summary of system hardware.
Understanding hardware documentation.
Using the internet for research.

Student Performance Objectives:

Student will describe what happens when you first turn on a computer, so that both the hardware and the software are poised to follow your directions; how hardware interacts with the system and how software manages hardware resources; and practical and easy ways to protect hardware and software.

The student will list the physical components are on the system board; and describe how the system board transports data, follows programming logic, and coordinates the time and execution of each processing task

(8 Hours) Understanding and managing memory

How DOS and Windows view memory, upgrading memory.

Physical memory, ROM and RAM.

Areas of the memory map, virtual memory.

Planning and pricing memory.

Using upper memory.

Troubleshooting memory.

Student Performance Objectives:

The student will describe the types of physical memory housed on the system board and expansion boards; how memory is used by DOS and Windows; how to manage memory using DOS and Windows; and how to upgrade the memory in a computer.

(8 Hours) Removable Drives

How data is physically stored on a disk.

Exchanging and supporting removable drives

The formatting process.

Using diagnostic software.

Troubleshooting skills.

Comparing the data storage cost of devices.

Using the internet for research.

(8 Hours) Introduction to hard drives

How a hard drive is logically organized to hold data

Operating system commands to manage a hard drive

Optimizing a hard drive.

Hard drive technology.

Fragmentation, cross-linked and lost clusters, disk compression, disk caching.

Examining a hard drive's BIOS settings.

Examining the first entries at the beginning of a hard drive.

Recovering a file.

Student Performance Objectives:

The student will describe how data is stored on removable drives and on a hard drive; how to use DOS and Windows commands to manage data on drives; how to identify the various types of hard drives and understand the advantages of each; and how to manage a hard drive to optimize its performance.

The student will install a hard drive and use diagnostic software and apply troubleshooting skills.

(8 Hours) Hard drive installations and support

Hard drives and data recovery

Installing a hard drive.

Partitioning the hard drive.

OS or high-level format.

Installing software.

Multiple operating systems.

Utility software.

Damaged root directory.

Corrupted system files.

Corrupted data and program files.

Hard drive troubleshooting guidelines.

Hard drive does not boot.

Drive retrieves and saves data slowly.

Computer will not recognize a newly installed hard drive.

Research third party software on the internet.

Data recovery services.

(8 Hours) Troubleshooting fundamentals, tools, guidelines.

Troubleshooting tools

Bootable rescue disk

Diagnostic tools and software.

Virus detection software.

How to isolate computer problems and devise a course of action.

Troubleshooting guidelines

The power system

The system board

The operating system and hard drive

Booting, keyboard and monitor

Create a boot or rescue disk

Documentation.

Back ups.

Interacting with the user

Using the windows control panel.

Student Performance Objectives:

Student will discuss the recent evolution of several system-board components and how to set the CPU and system bus frequency for the system board.

(5 Hours) Supporting I/O devices

Basic principles of peripheral installations

Using port and expansion slots

Keyboards

Computer video and monitors, video memory

Hardware devices and device drivers.

Application software.

Using ports and expansion slots for add-on devices

Serial ports, Parallel ports, USB ports.

Keyboards and connectors.

Pointing devices, cleaning the mouse.

Protected-mode and real-mode drivers.

(4 Hours) Multimedia Technology.

Multimedia on a PC.

What CPU technologies do for multimedia.

Devices supporting multimedia. CD-ROM drives, sound cards, digital cameras, MP3 player, DVD.

Preparing for a Windows crash.

Comparing sound quality.

Troubleshooting skills.

(5 Hours) Electricity and Power Supplies

Surge protection and battery backup.

Introduction to basic electricity, voltage, amps, the relationship between voltage and current, ohms, wattage, AC and DC current, hot, neutral and ground.

Measuring the voltage supply.

Using a multimeter.

Power supply troubleshooting guidelines.

Upgrading the power supply.

Energy star computers.

Surge protections and battery backup.

Uninterruptible power supply.

Fire extinguishers.

Student Performance Objectives:

The student will discuss how electricity is measured; how to measure the voltage output of the power supply; how to change a power supply; and how the computer system can be protected from damaging changes in electrical power.

(4 Hours) Purchasing a PC or building your own.

Viruses, disaster recovery, and a maintenance plan that works.

Selecting a personal computer to meet your needs.

Preparing to build your own PC.

Building a personal computer, step by step.

Preventative maintenance.

Viruses and other computer infestations.

All about backups and fault tolerance.

Student Performance Objectives:

The student will list pros and cons of assembling a PC from parts, and discuss preventive maintenance and procedures designed to protect systems.

(2 hours) Final Exam

Weekly Homework:

Read the assigned pages in the text. Take the corresponding online quiz and complete the assigned projects and internet searches.

METHODS OF INSTRUCTION:

Lecture, demonstration, video, Internet searches, team projects

METHODS OF EVALUATION:

CATEGORY 1 - The types of writing assignments required:

Percent range of total grade: 10 % to 20 %

Written Homework

CATEGORY 2 -The problem-solving assignments required:

Percent range of total grade: 30 % to 70 %

Homework Problems

Quizzes

Exams

CATEGORY 3 -The types of skill demonstrations required:

Percent range of total grade: 10 % to 20 %

Performance Exams

CATEGORY 4 - The types of objective examinations used in the course:

Percent range of total grade: 10 % to 40 %

Multiple Choice

True/False

Matching Items

Completion

REPRESENTATIVE TEXTBOOKS:

Required:

Jean Andrews, CompTIA A+ Guide to Managing and Maintaining Your PC, Course Technology, 2013, or other appropriate college level text.

Reading level of text, Grade: 12+ Verified by: ev

ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:

CSU GE:

IGETC:

CSU TRANSFER:

Transferable CSU, effective 200630

UC TRANSFER:

Not Transferable

SUPPLEMENTAL DATA:

Basic Skills: N

Classification: Y

Noncredit Category: Y

Cooperative Education:

Program Status: 1 Program Applicable

Special Class Status: N

CAN:

CAN Sequence:

CSU Crosswalk Course Department: CSIS

CSU Crosswalk Course Number: 181

Prior to College Level: Y

Non Credit Enhanced Funding: N

Funding Agency Code: Y

In-Service: N

Occupational Course: C

Maximum Hours:

Minimum Hours:

Course Control Number: CCC000348004

Sports/Physical Education Course: N

Taxonomy of Program: 070820