

Course Outline

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

TERM EFFECTIVE: Spring 2021 **CURRICULUM APPROVAL DATE:** 12/8/2020

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.

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

71 - Dist. Ed Internet Simultaneous

72 - Dist. Ed Internet Delayed

STUDENT LEARNING OUTCOMES:

By the end of this course, a student should:

1. Describe how a computer works in general terms.
2. Analyze computer operating problems.
3. Use troubleshooting tools to diagnose and repair computers.
4. Assemble a computer using components.

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

Curriculum Approval Date: 12/8/2020

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: 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: Describe what happens when you first turn on a computer, so that both the hardware and the software are poised to follow your directions. Explain how hardware interacts with the system and how software manages hardware resources; and practical and easy ways to protect hardware and software. List the physical components 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: 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.

Student Performance Objectives: Explain how data is stored on a disk and the formatting process. Demonstrate utilizing 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: 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. 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.

Student Performance Objectives: Explain and demonstrate how to install hard drives. List the hard drive troubleshooting guidelines.

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: 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.

Student Performance Objectives: Discuss using port and expansion slots and utilize port and expansion slots for add-on devices. List and state the reason for using various ports.

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.

Student Performance Objectives: Explain what CPU technologies do for multimedia. Discuss the devices supporting multimedia. Apply 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: 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: List pros and cons of assembling a PC from parts, and discuss preventive maintenance and procedures designed to protect systems.

2 Hours

Final Exam

METHODS OF INSTRUCTION:

Lecture, demonstration, video, Internet searches, team projects

OUT OF CLASS ASSIGNMENTS:

Required Outside Hours: 60

Assignment Description:

Read the assigned pages in the text. Take the corresponding online quiz.

Required Outside Hours: 84

Assignment Description:

Complete the assigned projects and internet searches.

METHODS OF EVALUATION:

Percent of total grade: 10.00 %

Percent range of total grade: 10% to 20% Written Homework

Problem-solving assignments

Percent of total grade: 60.00 %

Percent range of total grade: 40% to 70% Homework Problems, Quizzes, Exams

Skill demonstrations

Percent of total grade: 20.00 %

Percent range of total grade: 10% to 20% Performance Exams

Objective examinations

Percent of total grade: 10.00 %

Percent range of total grade: 10% to 40% Multiple Choice, True/False, Matching Items, Completion

REPRESENTATIVE TEXTBOOKS:

Jean Andrews, Joy Dark, Jill West. CompTIA A+ Guide to Managing and Maintaining Your PC, Ninth Edition. Boston, MA: Cengage, 2017.

ISBN: 9780357687727

Reading Level of Text, Grade: 12+ Verified by: Ellen Venable

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