Systems Course

Course Scope and Sequence Outline

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Introduction

This course provides a hands-on introduction to computer systems, including servicing, upgrading, and maintaining both hardware and software. It is one of the core courses offered in this IT program.

The *Systems* course starts with an introduction to basic safety procedures which must be followed to prevent personal injury or death, as well as protect sensitive electrical components from damage.

Next, students learn how to set up common types of computer hardware, install an operating system, configure the network interface to a local network, and connect the computer to the Internet through the local network.

Then application software is discussed.

The course then guides students through preventive maintenance, upgrading, and maintaining processing components, memory and storage components, input components, and output components.

Next, it addresses protecting, maintaining, and upgrading operating system and application software.

It also provides an introduction to basic troubleshooting techniques.

Finally, students get a chance to discover what types of careers exist in systems work today.

Course Objectives

After taking this course, students will be able to:

- Understand basic safety procedures which must be followed to prevent personal injury or death, as well as protect sensitive electrical components from damage.
- Set up common types of computer hardware, install an operating system, configure the network interface to a local network, and connect the computer to the Internet through the local network.
- Install, configure, upgrade, and maintain application software, and protect user data.
- Perform preventive maintenance, upgrade, and maintain processing components, memory and storage units, input components, and output components.
- Protect, maintain, and upgrade operating system and application software.
- Apply basic troubleshooting techniques to resolve common problems.
- Describe types of systems-related careers.

Course Projects

In the process of completing this course, students will have the opportunity to complete the following projects:

- **Project 1:** *TBD*
- **Project 2:** *TBD*

Springboard, Unit 1

Unit 1: Getting Started

Lesson 1: Course Objectives

- What are the goals of this course?
    - Student goals.
    - Teacher's goals.
    - Program goals.
- What types of outcomes can students expect in this course?
    - Course overview.
    - Program ambitions.
    - Student exemplars.

Lesson 2: Safety

- What documentation is necessary to be properly informed of the hazards that are present when handling or maintaining computer equipment?
    - Material Safety Data Sheets (MSDS).
    - Appropriate detailed manufacturer's equipment documentation.
- What types of personal safety hazards exist when handling or maintaining computer equipment?
    - Electrical shock.
    - Chemical burns.
    - Back injuries due to improper lifting techniques.
    - Foot injuries due to dropped hardware.
- What is electro-static discharge, why is it a problem, and what can be done to control it?
    - Why it is important.
    - Causes.
    - Preventive equipment and techniques.
- What techniques are used to properly dispose of computer components, cleaners, and chemical solvents?
- Batteries.
- Electrical components.
- Display devices.
- Cleaners and chemical solvents.
- Problems with heavy metals.
- Environmental concerns.

Activity Sequence, Units 2–4

Unit 2: Set-up

Lesson 3: Types of Computer Hardware

- What is a field replaceable unit (FRU) and why is this concept important?
  - All modern computers are modular.
  - This lowers production costs and allows the owner to add or replace components as newer, more capable, more cost-effective ones become available.
  - There is no need to send the computer back to the factory to have the new components added.
- What system components are typically found in a modern computer?
  - Motherboard (aka main board, logic board, or system board.)
  - Central processing unit (Intel® or AMD® plus CPU-mounted fan.)
  - Random access memory (RAM.)
  - Basic Input Output System (BIOS.)
  - Power supply.
  - Video display controller and display (CRT and LCD.)
  - Computer bus(es) (ISA, PCI, etc.)
  - Removable storage devices (DVD/CD-ROM drives, floppy drives, solid state memory sticks, USB memory devices.)
  - Hard disk drive (IDE, SCSI, SATA, PATA.)
  - Adapter cards (modems, network cards, wireless network cards, and sound cards.)
  - Signal cables.
  - Input components (keyboard, mouse, microphone, joystick, scanner, pens, and touch screens.)
  - Printers, scanners, and combination machines.

Lesson 4: Hardware Set-up

- How is a computer set-up?
  - The motherboard and power supply are installed in case first.
  - Other hardware is installed based on accessibility.
  - The CPU/mounted fan is usually installed last.
- How is a new hardware set-up tested?
- Testing of basic components is done by BIOS during power-on self-test.
- More sophisticated components are tested through actual use, so they require a functioning operating system.
- May also use OS applets such as Device Manager in Windows XP.

Lesson 5: Operating System Choices

- What are the most commonly used operating systems available today?
  - Microsoft XP/Vista.
  - Linux.
  - Mac OS 10.X.

[snip – The remaining pages of this document have been omitted so the document is a reasonable length.]