Computer Hardware

Course Overview

This beginner IT course focuses on the practical aspects of building PCs and repairing computer hardware. Students will gain hands-on experience with diagnosing hardware issues, assembling PCs, and understanding the intricacies of computer architecture. The culminating project involves constructing a custom computer, tailored to fit a given budget and performance specifications.

Course Objectives

- Identify and understand the functions of the CPU, GPU, motherboard, memory, storage, power supply, and cooling system.
- Diagnose and troubleshoot common hardware issues.
- Understand the principles of memory, storage, power supply, and cooling options, making informed decisions based on system requirements.
- Navigate and configure BIOS/UEFI settings for optimal hardware performance.
- Complete a final project that demonstrates the ability to plan, budget for, and build a custom PC, reflecting an integration of course content and practical skills.

PC Building Guide

Building a PC - Use this complete PC Building guide as a reference throughout the remainder of this course.

Unit 1: Introduction to Computer Hardware

Familiarize students with the basic components of computer hardware and their functions.

- ☐ Video - How Does Computer Hardware Work?
- ☐ Reading - CPU, GPU, Motherboard
- ☐ Video - Inside the CPU - Computerphile
- ☐ Video - CPU vs GPU (What's the Difference?) - Computerphile
- ☐ Video - BIOS and UEFI As Fast As Possible
- ☐ Hands-on Exercise - Navigating the BIOS/UEFI

Unit 2: Memory, Storage, Power, and Cooling

Explore the roles and types of memory, storage solutions, power supplies, and cooling systems.

- [ ] Reading - RAM, Storage, PSU, and Cooling
- [ ] Video - SSDs vs Hard Drives as Fast As Possible
- [ ] Video - TLDR: How Heatpipes & Air Coolers Work (w/ animation)
- [ ] Hands-on Exercise - Identifying Computer Hardware
- [ ] **Unit 2 Test**

Unit 3: Building a PC

Apply knowledge to build a PC. This involves planning ahead and shopping for parts, safely assembling the hardware components, and installing an operating system.

- [ ] PC Building Test
- [ ] Final Project: Build a Custom PC
    - Overview - Build a custom PC based on a specified budget and requirements. Document the process. (If the budget doesn't allow for a brand new PC, have students disassemble and reassemble an old PC and treat it as if it were a new build. Another option: PC Building Simulator)
    - Exercise - Create a list of components to purchase based on the budget and requirements.
    - Hands-on - Assemble the PC, install the OS, and test all functionalities.
    - Presentation - Present the built PC, explaining the choice of components and any issues faced during assembly.