

Computing Workshop: Hardware Syllabus

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Fall 2018

Website: <http://computing-workshop.com/>

Location: B21, 651 rue Sherbrooke Ouest (Northeast corner of University street)

Time: Monday from 2:00PM to 4:00PM, on

- September 10, 17, 24,
- October 1, (no class on Thanksgiving), 15, and 22.

Goal: At the end of the workshop, participants will be able to identify the core hardware components of a modern computer and describe their function. They will be able to construct simple hardware components using discrete circuitry and describe how these components work together to form a computer.

Description

Computing Workshop: Hardware Unit is the half of Computing Workshop that focuses on the physical components of computers. This unit introduces to participants to binary and elementary circuitry elements such as transistors, eventually leading up to recreating memory and arithmetic and logic unit of a CPU. The workshop climbs the ladder of abstraction, providing participants with a high level understanding of processors and operating systems.

Rationale

We created this workshop to provide people with the support to feel comfortable using a computer. Technology is pervasive in our society, but rarely are individuals provided with meaningful education about how to they work. Our workshop focuses on hands on learning. Circuits are implement on breadboards and larger processes are simulate with group activities, allowing students to create their own understanding of the hardware of a computer.

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Lesson sequence

0. Intro to circuits and electricity
1. Logic and the transistor
2. Intergrated circuits (ICs), the half adder, and ALU
3. Memory
4. Processor
5. Operating systems and conclusion

Learning goals

Computers

- identify key hardware components of a computer;
- effectively use the electronic components necessary in creating circuits;
- describe each hardware component's function;
- recreate basic hardware components using circuits;
- identify core services provided by an operating system;