Université d'Ottawa
Faculté de génie

École de science informatique
et de génie électrique

uOttawa

L'Université canadienne
Canada's university

University of Ottawa
Faculty of Engineering

School of Electrical Engineering
and Computer Science

CEG2136 - Computer Architecture I (3, 1.5, 3b)

Fall 2018

Instructors:

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Description

Design a digital computer to execute a given instruction set. Design of digital computers. Register transfer and micro-operations. Designing the instruction set, Central Processing Unit (CPU) and CPU control. Basic machine language programming. Using pipelines for CPU design. Designing the memory unit. Designing Input-Output subsystem.

Prerequisite: ITI 1100 (Digital Systems I)

Course Learning Outcomes

By the end of the course, students:

- Will understand the computer elements and the fundamentals of computer organization, and will get knowledge on the principles of computer architecture.
- Have gained experience with basic design at various levels, from instruction set architecture (ISA) to datapath and control logic; small projects will be developed by using modern CAD environments and will be practically implemented on Field Programmable Gate Arrays (FPGA's).
- Developing programs in machine language that run on their own designed/built computers, students will sense and understand the interface between the software and computer hardware.

Course Outline

1. Digital Logic Circuits.
2. Digital Components.
3. Data Representation.
4. Register Transfer and Micro-operations.
5. Basic Computer Organization and Design.
6. Programming the Basic Computer.
7. Microprogrammed Control
8. Central Progressing Unit (CPU).

Textbook

M. Morris Mano, "Computer System Architecture", 3rd edition, Prentice Hall, 1993.

Recommended Textbook

Donald D. Givone, Digital Principles and Design, McGraw Hill,2003

Lab Work: Laboratory rules and regulations will be posted on the course Virtual Campus site. Four labs have been organized and will be distributed along the term proportional with their degree of difficulty. You will be working in groups of 2 students. The same group will work together throughout the semester. A lab report is expected from each group. The lab report should be prepared according to the guidelines found in the lab manual. The report will be submitted electronically (in WORD format).

The mid-term exam is a closed book exam and covers material presented in the weeks prior to the mid-term**.** The mid-term schedule is to be announced (date TBD).

The final exam is also closed book and will cover all material studied during the term.

Grading

Quizzes	10%
Lab work	20%
Midterm Examination	25%
Final Examination	45%

Course Schedule:
https://web30.uottawa.ca/v3/SITS/timetable/Course.aspx?id=003570&term=2189&session=FS

Class attendance is mandatory. Each student must attend one discussion group (DGD) and one laboratory group as assigned. As per academic regulations, students who do not attend 80% of the class will not be allowed to write the final examinations.

All components of the course (i.e., laboratory reports, quizzes etc.) must be fulfilled; otherwise students may receive an INC as a final mark (equivalent to an F).

Academic Integrity is expected from all students participating in this course. Academic fraud is an act by a student that may result in a false evaluation (including reports, tests, examinations, etc.). Any person found guilty of academic fraud will be subject to severe sanctions. Here are some examples of academic fraud:

- Plagiarism or cheating of any kind;
- Present research data that has been falsified;
- Submit a work for which you are not the author, in whole or part;
- Submit the same piece of work for more than one course without the written consent of the professors concerned.

Please consult this webpage https://www.uottawa.ca/vice-president-academic/academic-integrity/resources-students: it contains regulations and tools to help you avoid plagiarism.
An individual who commits or attempts to commit academic fraud, or who is an accomplice, will be penalized. You can refer to the regulations on this webpage:
https://www.uottawa.ca/administration-and-governance/academic-regulation-14-other-important-information