



DEPARTMENT OF ELECTRICAL AND
COMPUTER ENGINEERING

ENCM 369

Computer Organization, H(3-1T-1.5), Winter 2009

COURSE OUTLINE

1 Description

From the University of Calgary Calendar:

"Organization of a simple stored-program computer: CPU, busses and memory. Instruction sets, machine code, and assembly language. Conventions for assembly language generated by compilers. Floating-point number representation. Hardware organization of simple processors. Address translation and virtual memory. Very introductory examples of input/output devices, interrupt handling and multi-tasking systems."

Prerequisites: ENCM 339 and ENEL 353.

2 Objectives

- Basic understanding of computer organization: roles of processors, main memory, and input/output devices.
- Understanding the concept of programs as sequences of machine instructions.
- Understanding the relationship between assembly language and machine language; development of skill in assembly language programming; understanding the relationship between high-level compiled languages and assembly language.

- Understanding arithmetic and logical operations with integer operands.
- Understanding floating-point number systems and operations.
- Understanding simple datapath and control designs for processors.
- Understanding memory organization, including cache structures and virtual memory schemes.

3 Lectures/Labs/Tutorials

Times and locations are as follows:

Section	Days	Time	Duration	Location
L01	TR	9:30	75	ENA 103
L02	TR	12:30	75	ICT 121
T01	M	14:00	50	ENE 239
T02	M	15:30	50	ENE 239
B01	M	15:30	75	ICT 215
B02	M	14:00	75	ICT 216

4 Course Instructors

Section	Name	Telephone	Office	Email
L01/T01/T02	Dr. S. A. Norman	220-8642	ICT 411	norman@ucalgary.ca
L02/B01/B02	N. R. Bartley	220-5060	ICT 306	nbartley@ucalgary.ca

5 Examinations

There will be a midterm and a final examination. Both examinations are *closed-book* and *closed-notes*.

6 Use of Calculators in Examinations

No calculators or computers may be used during examinations. The only digital devices permitted are digital watches. Cell phones must be turned off during examinations.

7 Final Grade Determination

The final grade in ENCM 369 will be based on the following components:

Component	Weighting
Laboratory Assignments	20%
Midterm Examination	30%
Final Examination	50%
Total	100%

A mark of 40% or higher on the final exam is needed to pass the course as a whole. The course instructors reserve the right to reduce this threshold of 40% if it is judged after marking the final exam that the final exam was more difficult than intended. Conversion from a score out of 100 to a letter grade will be done using a scale determined after the final examination has been marked. This allows the creation of a scale appropriate to the relative difficulty or easiness of the mid-session test and final exam. As a *rough guideline*, here is the scale used in this course in the recent past:

Grade	Total Mark	Grade	Total Mark
A+	90.5%	C+	63.5%
A	86.0%	C	59.0%
A-	81.5%	C-	54.5%
B+	77.0%	D+	50.0%
B	72.5%	D	45.5%
B-	68.0%	F	< 45.5%

For example, a student with 18.77 / 20 for labs, 19.00 / 30 for the mid-session test, and 37.08 / 50 for the final exam would have got a course score of $18.77 + 19.00 + 37.08 = 74.85$ and would have been given a B in the course. *The scale used this year will be similar but probably not identical to scales from other years.*

8 Principles of Conduct

The University of Calgary Calendar includes a statement on the Principles of Conduct expected of all members of the University community (including students, faculty, administrators, any category of staff, practicum supervisors and volunteers) whether on or off the University's property. This statement applies in all situations where the Members of the University Community are acting in their University capacities. All Members of the Univ-

ersity Community have a responsibility to familiarize themselves with this statement which is available at:

http://www.ucalgary.ca/pubs/calendar/2008/how/How_LB.htm

The Engineering Students' Society Code of Conduct was developed to ensure that students are safe and free from danger and risk, and that discussion, criticism and comment are encouraged within a framework of professional behavior. The Engineering Students' Society Code of Conduct is available at:

http://ess.ucalgary.ca/downloads/official_documents/Code_of_Conduct.pdf

9 Academic Misconduct/Plagiarism

The University of Calgary Calendar defines plagiarism as:

“submitting or presenting work in a course as if it were the student’s own work done expressly for that particular course when, in fact, it is not.”

Plagiarism is academic misconduct. Please read the section in the University Calendar on Plagiarism/Cheating/Other Academic Misconduct which is available at:

http://www.ucalgary.ca/pubs/calendar/2008/How/How_MB.htm

10 Textbook

The following textbook is *required* for ENCM 369:

- David A. Patterson and John L. Hennessy, *Computer Organization and Design: The Hardware/Software Interface*, 4th Edition, Morgan Kaufmann Publishers, 2008, ISBN 978-0-12-374493-7.

Use of the 3rd Edition of this textbook is strongly discouraged. Coverage of processor hardware design in Chapter 4 of the 4th Edition is very different from what is in Chapters 5 and 6 of the 3rd Edition.

11 Academic Accommodation Policy

It is the student’s responsibility to request academic accommodations. If you are a student with a documented disability who may require academic accommodation and have not registered with the Disability Resource Centre, please contact their office at 403-220-8237. Students who have not registered with the Disability Resource Centre are not eligible for formal academic accommodation. You are also required to discuss your needs with your instructor no later than fourteen (14) days after the start of this course.

12 Engineering FOIP Policy

SCHULICH SCHOOL OF ENGINEERING UNIVERSITY OF CALGARY POLICY FOR IMPLEMENTATION OF FOIP REQUIREMENTS

Protection of Student Examinations and Course Work Under the Freedom of Information and Protection of Privacy Act of the Province of Alberta

The Schulich School of Engineering policy is intended to ensure that examinations and term-work of students in engineering courses are protected with respect to privacy. The philosophy behind the policy is that marked student examinations and term-work (hereafter called “student’s work”) should be available only to the student and to staff in the Schulich School of Engineering who have a need to see the material. This includes academic staff, graduate assistants and support staff.

Please read the Faculty of Engineering FOIP Policy:

<http://www.ucalgary.ca/eng/courses/Engg/FOIPPOLICY.html>

13 Other Information

13.1 Course Web Site

You are strongly encouraged to use the Internet to look up course information. For example, you will be able to use the Web to read: this outline; information about the teaching assistants; many lecture-related handouts; all lab handouts; some lab solutions. (Not much of this information will be available right at the beginning of the term. The set of course pages will grow as the term progresses.) The URL for the ENCM 369 Home Page is

<http://www.enel.ucalgary.ca/People/Norman/encm369winter2009/>

13.2 Get Help, But Don’t Cheat!

Do the lab assignments by yourself, or in active collaboration with a partner when you are permitted to work with a partner. If you copy someone else’s work or let someone else figure out all the difficult exercises for you, you will not learn very much.

This does not mean that you should not get help from others while you are doing your assignments. You are encouraged to discuss the assignments with instructors and fellow students, since this is one of the best ways to learn the material. However, you should not let anyone write your programs or solve other exercises for you. When you hand in your assignments, ask yourself two questions:

1. *Do I understand all the material I am handing in?*

2. *Could I do this assignment over again without any help?*

The answer to both questions should be **YES**.

Computers allow electronic copying of programs, which makes it very easy to cheat in a course like ENCM 369. If you are caught cheating you may be reported to the Dean's Office for appropriate discipline. If you cheat and don't get caught, you are still in trouble, because examination marks count much more than assignment marks in your final course grade.

13.3 Missed or Delayed Term Work

You are expected to complete all lab assignments and hand them in on time, and you are expected to write the mid-session test at the scheduled time.

If you don't hand in some term work due to illness, domestic affliction, or another legitimate reason, the course instructors are willing to make accommodations, but only if you report the problem to your lecture instructor—*not* a graduate teaching assistant—as soon as is reasonably possible. Accommodations for missed term work will be decided on a case-by-case basis; typically they will involve either accepting lab assignments after the due date or making changes to the weighting used to compute the course grade.
