

CONCORDIA UNIVERSITY
DEPARTMENT OF MECHANICAL AND INDUSTRIAL ENGINEERING

MECH 368 /4M - Electronics for Mechanical Engineers
COURSE OUTLINE (Winter 2016-2017)

	Session	Day	Time	Room
Lectures:	M	TuTh	10:15-11:30	FG-C080
Tutorials:	M MA	Tu	11:45-12:35	H-431
	M MB	Th	11:45-12:35	H-431
Labs:	MI-X	Mo	16:45-18:35	H-1053
	MJ-X	Mo	16:45-18:35	H-1053
	MK-X	Mo	14:45-16:35	H-1053
	ML-X	Mo	14:45-16:35	H-1053
	MM-X	Fr	11:45-13:35	H-1053
	MN-X	Fr	11:45-13:35	H-1053
	MO-X	Th	14:45-16:35	H-1053
	MP-X	Th	14:45-16:35	H-1053

COURSE INSTRUCTOR: Dr. Ameer Abdelhadi <ameer.abdelhadi@concordia.ca> <u>Office:</u> EV3.276 ext. 3462; <u>Office hours:</u> TuTh 11:45-12:15
LAB COORDINATOR: Tianhe Wen <wen@encs.concordia.ca> <u>Office:</u> S-1060 ext:3127
Tutorial TA: Nima Bayatmakou <n.bayatmaku@gmail.com>
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Labs MK, ML, MO, MP: Srinivas Bathini <bathini.srinivas3@gmail.com>

TEXTBOOK: "Electronics for Mechanical Engineers" ISBN: 9781259068997, McGraw-Hill, 2012.
 Create Print from: "Principles and Applications of Electrical Engineering"
 by: Giorgio Rizzoni, 5th edition, McGraw-Hill, 2007.

I. COURSE OBJECTIVES:

This course exposes students to the essentials of electronic technology and the rudiments of design so that they, as mechanical engineers, can understand the operation of basic electronic circuits in the field of controls and instrumentation. The course covers basic circuits, including linear and non-linear circuit analysis, basic semiconductor electronic devices, and electronic systems, including digital and analog systems, and analog-digital interface circuits.

The following applied knowledge and skills will be acquired upon completion of the course:

- Understanding the role and analysing the behaviour of various types of electronic circuits.
- Learning the tools and techniques, and laboratory equipment, for analysing the operation of electronic circuits.

II. LECTURE TOPICS AND SCHEDULE (dates are tentative, subject to change):

Lecture#	Date	Time	Room	Topic	Chapter
1,2,3	Jan. 10,12,17	10:15-11:30	FG-C080	Introduction - electric circuits	1, 2, 3.5 onwards
4,5,6,7	Jan. 19,24,26,31	10:15-11:30	FG-C080	Semiconductors and Diodes	9
8,9,10,11	Feb. 2,7,9,14	10:15-11:30	FG-C080	Bipolar Junction Transistors (BJT)	10
12	Feb. 16	10:15-11:30	FG-C080	Field Effect Transistors (FET)	11
13	Feb. 28	10:15-11:30	FG-C080	MIDTERM EXAM #1	
14,15,16	Mar. 2,7,9	10:15-11:30	FG-C080	Field Effect Transistors (FET) - cont'	11
17,18,19	Mar. 14,16,21	10:15-11:30	FG-C080	Operational Amplifiers	8
20	Mar. 23	10:15-11:30	FG-C080	MIDTERM EXAM #2	
21,22,23,24	Mar. 28,30, Apr. 4,6	10:15-11:30	FG-C080	Digital Logic Circuits	13
25,26	Apr. 11,13	10:15-11:30	FG-C080	Digital Systems	14

* Tutorials, starting in the week of January 9 (week #1), will cover the same topic as the lectures.

III. LABORATORY:

The laboratory sessions provide the student with the opportunity to build and test a number of analog and digital circuits as well as to become familiar with basic electronic test equipment such as oscilloscopes, DVM's, counters, power supplies and curve tracers. In general, the experiments can only be completed within the allotted time if the student is prepared and organized. **To ensure adequate participation by all students, lab groups are limited to a maximum of three (3) students. Each group must submit one lab report on the following lab period.**

The experiments are:

- #1 Familiarization with Laboratory Equipment
- #2 Diodes and Power Supply
- #3 BJT Transistors
- #4 Operational Amplifiers and their Applications
- #5 Design of Modulo-4 Up/Down Synchronous Counter

- For the lab schedules, the week of Jan. 09 is week #1. The week of Jan. 16 is week #2, then week Jan. 23 is week #1 and so on alternatively. **Laboratory classes will start in the week of Jan. 16 (week #2).**
- Transfers between lab sections are not allowed.
- If a student—including students repeating the courses—misses any lab, this will constitute a grade of “**INC**”.
- **Attendance and participation in the lab will be verified by the lab instructor during each session.**
- **Every student must sign the “LAB ATTENDANCE SHEET”.**

IV. ASSIGNMENTS:

- **NO LATE** assignments will be accepted beyond the date of submission.
- Assignments must be **submitted in class (within 15 minutes from the “start” of the class).**

V. EXAMINATIONS:

- Midterms and final exam are closed book; you may not have any reference except of **one 8.5”×11”** (letter size) sheet of paper with notes on **one side** only, either printed or handwritten.
- Only certain types of non-programmable calculators are permitted in ENCS midterms and final exams. Please have your calculators approved with an ENCS stamp.
- The possession of cell or smart phones is strictly prohibited during all exams.

VI. GRADING:

Assignments	10%
Lab Work	15%
Midterm #1	15%
Midterm #2	15%
Final	45%
Total	100%

Notes:

- In order to achieve a passing grade in the course, the student must have a **50% passing grade on the combined two Midterms plus Final Examination.** If the total grade in the three exams is less or equal to 25%, this will constitute a **course repeat (“R” grade).**
- The student must also achieve a **50% passing grade** on the Assignments, and a **50% passing grade** on the Laboratory Work.

* There is no fixed relationship between marks and letter grades.

NOTES:

- An incident report shall be filed for any homework or lab reports containing “*plagiarism*”. All students must read and be familiar with ‘**Academic Integrity**’, ‘**Code of Conduct**’, and ‘**What is Plagiarism?**’ These subjects can be found on Concordia’s webpage: <http://www.concordia.ca/students/academic-integrity.html>. Additional information can be found in Section 17.10 on pages 54-60 of the 2016-2017 Undergraduate Calendar.
- In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.