UNIVERSITY OF GUELPH
SCHOOL OF ENGINEERING

ENGG*3450: ELECTRICAL DEVICES

COURSE OUTLINE - FALL 2012

CALENDAR DESCRIPTION

Conduction in metals and semi-conductors; principles of modern electronic devices and their application in circuits; diodes; bipolar and field effect transistors; circuit integration; operational amplifiers; logic gates.

PREREQUISITE

ENGG*2450: Electric Circuits

TEXT

Title: Electronic Devices and Circuit Theory, 10th edition
Author: Robert L. BOYLESTAD and Louis NASHELSKY
Publisher: Prentice Hall

COURSE OBJECTIVES

Students who successfully complete this course will be able to:

1. describe the basic principles of operation of semiconductor diodes and transistors and use their specifications in the design of circuits,
2. develop models of operational amplifiers for the design of signal processing circuits,
3. gain understanding of binary logic circuits to develop decision making systems,
4. become familiar with the operation and characteristics of some of the most commonly used Integrated Circuits units (ICs).

CONTACT

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EVALUATION

Method A		Method B		Date/Time/Location
Laboratory (5 sessions)	30%	Laboratory (5 sessions)	30%	Course Calendar, THRN 2196
Midterm(*)	30%			Thur. Oct 25,2012 5:30PM – 6:50PM Location: Roz 102/103
Final Exam(*)	40%	Final Exam(*)	70%	Fri, Dec 14, 2012, 8:30AM - 10:30AM, Location: TBA

(*): Please refer to **NOTES** for important evaluation details

PRESENTATION METHOD

- Three lectures per week on Mon, Wed and Fridays from 12:30 – 1:20PM in MAC 149
- Labs and tutorials in alternating weeks: 5 labs and 6 tutorials (please refer to course calendar)
- Bi-weekly non-graded problem sets that complement class material (discussed in tutorials)
- Office hours and in class/tutorial consultation. Office hours schedule will be posted on the course website.

LABS

- Lab experiments will be carried out by groups of **at least 2 and no more than 3 students**. Groups will form in the first week of labs and will not change during the course of the term.
- Safety in the lab is a priority at all times. The labs are designed to be safe (the voltages are low), but be aware of the fact that misconnected devices may get **extremely hot** even to the point of bursting into flames! Please always make sure that your connections are done correctly before turning the power on.
- Each group must finish their experiments in the scheduled lab session. An additional 30 minutes will be granted on the following week for groups who may need extra time to finish their experiments, provided that their work is not disruptive to other students and to the TA conducting the tutorial. The lab evaluation is based on attendance and lab report.
- ***Group*** lab reports are to be submitted in the inbox according to the following schedule:

LAB (1)	Tue, Oct 2, 8:30 AM	LAB (4)	Tue, Nov 13, 8:30 AM
LAB (2)	Tue, Oct 16, 8:30 AM	LAB (5)	Tue, Nov 27, 8:30 AM
LAB (3)	Tue, Oct 30, 8:30 AM		

- The report for each lab will consist of:
  - Section 1: Introduction and Background (combined)
  - Section 2: the procedures used, measurements, results (also combined)
  - Section 3: discussion of results, errors/discrepancies and concluding remarks
  - Appendix: All data gathered during lab session

COURSE CONTENTS

Topic	Number of Weeks(*)
Review and introduction to Semiconductors	1
Diodes and their applications	1.5
Bipolar Junction Transistors	2.5
Field Effect Transistors	2
Operational Amplifiers	2
Oscillator Circuits	1.5
(Examples of IC circuits)	(1) (**)
(Power Supplies)	(1) (**)

(*) The numbers in this column are subject to change based on the class pace and needs.
(**) Potential topics to be covered (time permitting)

NOTES

1. Academic Misconduct: the School of Engineering operates on a zero-tolerance policy. Plagiarism will be reported. Please refer to the Undergraduate Calendar: Section VIII "Undergraduate Degree Regulations and Procedures – Academic Misconduct".

2. There will be **no academic consideration for a deferred midterm**. If a student does not write the midterm, the midterm weight is automatically added to his/her final exam (Method B). For students who write the midterm, their grade evaluation will be the best of the two evaluation methods (A, B) in such a way that will increase their total course grade. The two methods are described in the **EVALUATION** section.

3. If a student misses a lab session, his/her lab mark will not be recorded. It is the student's responsibility to attend and conduct lab experiments with his/her group. In case of absence (due to illness or other legitimate reasons), the student has to obtain the consent from the lab technician and responsible TA for an alternative time slot for the missed lab. The cover page of each lab report must indicate the percentage contribution of each member.

4. There will be a 5% deduction per hour from the lab mark submitted past the due time up to a total of 15%. Past 11:30AM on the due date, the grade for the lab report will be zero.