



Department of Electrical and Computer Engineering

COURSE OUTLINE

ELEC 365 – APPLIED ELECTRONIC AND ELECTRICAL MACHINES

Term - FALL 2014 (201409)

Instructor (Electronics)

Dr. Hannan Lohrasbipeydeh
E-mail: lohrasbi@uvic.ca

Office Hours

Days: Thursday
Time: 3 pm – 5 pm.
Location: EOW 403

Instructor (Electrical machines)

PhD candidate: Babak Manouchehrinia
E-mail: bmn14@uvic.ca

Office Hours

Days: Wednesday, confirm by Email
Time: 3 pm – 5 pm.
Location: EOW 419

Lectures

A-Section(s): A01 (11211) & A02 (11212)
Days: Mondays and Tuesdays
Time: 05:30 p.m. - 06:50 p.m.
Location: Bob Wright Center (BWC) – A104

Labs

B-Section(s):	Days:	Time(s):
B01&B02	Tuesday	08:30 - 11:20 pm
B03& B04	Wednesday	08:30 - 11:20 pm
B05& B06	Friday	08:30 - 11:20 pm
B07& B08	Thursday	04:00 - 06:50 pm

Location: ELW

Required Text

Title: Electrical Engineering Principles and Applications
Author: Allan R. Hambley
Publisher: Prentice-Hall (Pearson Education)
Year: 6th ed., 2013

Optional Text

Title: Electronic Devices
Author: T.L. Floyd
Publisher: Prentice-Hall.
Year: 2012 (9th Edition)

References: Lecture notes and article reprints available on website:

<http://www.ece.uvic.ca/~elec365/>

Assessment:

Assignments:	10%	
Labs	15%	
Mid-term	35%	Date: TBD
Final	50%	Date: TBD

Note: Failure to complete all laboratory requirements will result in a grade of N being awarded for the course.

Due Dates for Assignments: Due date to be announced.

The final grade obtained from the above marking scheme will be based on the following percentage-to-grade point conversion:

Passing Grades	Grade Point Value	Percentage for Instructor Use Only	
A+	9	90 – 100	
A	8	85 – 89	
A-	7	80 – 84	
B+	6	77 – 79	
B	5	73 – 76	
B-	4	70 – 72	
C+	3	65 – 69	
C	2	60 – 64	
D	1	50 – 59	
Failing Grades	Grade Point Value	Percentage for Instructor Use Only	Description
E	0	0 - 49	Fail, *Conditional supplemental exam. (For undergraduate courses only)
F	0	0 – 49	Fail, no supplemental.
N	0	0 – 49	Did not write examination, Lab or otherwise complete course requirements by the end of term or session; no supplemental exam.

**Assignment of E grade will be at the discretion of the Course Instructor.*

The rules for supplemental examinations are found on page 80 of the current 2014/15 Undergraduate Calendar.

Term in which E Grade Was Obtained	Application Deadline for Supplemental Exam	Supplemental Exam Date
First term of Winter Session (Sept – Dec)	February 28 in the following term	First week of following May
Second term of Winter Session (Jan – Apr)	June 30 in the following term	First week of following September
Summer Session (May – Aug)	October 31 in the following term	First week of following January

Deferred exams will normally be written at the start of the student's next academic term; i.e., approximately 4 months following the deferral of the exam.

Course Description

1. Course Objectives

- A basic understanding of the electric circuits and system including nonlinear components such as diodes, BJT and JFET transistors and examples of amplifiers.
- The capability to solve and analysis the simple nonlinear circuits and formulating the circuits equations for obtaining the required parameter of the circuits. Understanding the semiconductor components equations and formulating it jointly to the circuit equations.
- The ability to understand the concepts of the multiple terminals nonlinear components and their important applications such as amplifications, DC voltage sources, etc which are very common applications in the industry.
- Production of magnetic field and basic principles, magneto-motive-force, reluctance, fringing, magnetization curves, Faraday's law of electromagnetic induction, eddy currents, hysteresis.
- Basis and construction of transformer, development of linear equivalent circuit, primary and secondary side referred equivalent circuits, determination of equivalent circuit parameters.
- Structures and performance characteristics of dc, induction and synchronous machines, force equation, magnetic circuit and magnetization curve, EMF and torque equations; equivalent circuits for each one, performance as generators and motors; starting and speed control of different machines.

2. Learning Outcomes

- Compare a diode with a one way valve to illustrate its operation. Develop different diode models. Describe different types of diodes such as rectifier diodes, Zener diodes, etc. Analyze different diode circuits such as rectifiers, voltage regulators, limiters, clippers, voltage multipliers.
- Compare a BJT with a controlled one way valve to illustrate its operation. Describe different types of BJTs. Analyze the active, saturation and cut-off modes of NPN BJT. Evaluate four resistor biasing circuit. Analyze common emitter, emitter follower amplifiers using dc and ac equivalent circuits. Evaluate voltage regulators. Analyze PNP BJT based current sources.
- Basic principles of magnetic circuits, how to draw equivalent circuits and how to analyse them to calculate different parameters like flux, energy density. The basic principles of operation and construction details of transformers and dc machines (as a generator and a motor).
- The basic principles of operation and construction details of induction motors and synchronous machines (as a generator and as a motor); their equivalent circuits and their use in calculating performance parameters such as regulation and efficiency. Speed-torque characteristics of dc motors and induction motors and how to control their speed.

3. Syllabus

- Characteristics of electronic devices including diodes, bipolar junction transistors and operational amplifiers; analysis of practical electronic circuits such as rectifiers, voltage regulators, amplifiers and filters; fundamentals of electromechanical energy conversion; transformers; operating principles of rotating electric machines: dc machines and ac machines.

Note to Students:

Students who have issues with the conduct of the course should discuss them with the instructor first. If these discussions do not resolve the issue, then students should feel free to contact the ECE Chair by email or the ECE Chair's Secretary eceasst@uvic.ca to set up an appointment.

Accommodation of Religious Observance

See <http://web.uvic.ca/calendar2014/GI/GUPo.html>

Policy on Inclusivity and Diversity

See <http://web.uvic.ca/calendar2014/GI/GUPo.html>

Standards of Professional Behaviour

You are advised to read the Faculty of Engineering document Standards for Professional Behaviour at <http://www.uvic.ca/engineering/current/undergrad/index.php#section0-25> which contains important information regarding conduct in courses, labs, and in the general use of facilities.

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult

<http://web.uvic.ca/calendar2014/FACS/UnIn/UARe/PoAcl.html> for the UVic policy on academic integrity.