Faculty of Engineering

COURSE OUTLINE

ELEC 216 – Electricity and Magnetism
Term – SUMMER 2015 (201505)

Instructor
Dr. Jens Bornemann
Phone: 250-721-8666
E-mail: jbornema(at)ece(dot)uvic(dot)ca

Office Hours
Days: Tuesdays, Wednesdays
Time: 1:30-2:30 pm
Location: EOW 309

Course Objectives
Study the fundamentals of electromagnetics with emphasis on engineering applications.

Learning Outcomes
Upon completion of this course students should be able to:

a. Describe the basic properties of electric and magnetic forces.

b. Calculate the gradient of a scalar function and the divergence and curl of a vector function in any of the three primary coordinate systems.


d. Calculate the resistance, capacitance, and inductance of electromagnetic structures.

e. Apply the phasor-domain technique to analyze steady-state electromagnetic problems.

f. Evaluate the magnetic force and torque on a current-carrying structure due to a magnetic field.

Syllabus
Electric charge, Coulomb's Law, electrostatic forces, electric field, Gauss's Law, electric potential, stored energy. Electric current, conduction in a vacuum and in material media, displacement current, magnetic field of a current, force on a current carrying wire, magnetic induction, electromotive force, energy stored in a magnetic field. Time varying fields. Capacitance, resistance, inductance, and their characterization.

Lectures:
A-Section(s): A01 / CRN 30282
A-Section(s): A02 / CRN 30283
Days: Tuesdays, Wednesdays, Fridays
Time: 12:30 – 13:20
Location: ELL 060

Labs:
B-Section(s): B01
B-Section(s): B02
B-Section(s): B03
Location: ELL 129

Time: Thu 14:30-17:20
Wed 16:30-19:20
Mon 17:30-20:20

Tutorials:
T-Section(s): T01
Time: Tue 14:30-15:20
Location: ECS 108
Required Text
Title: Fundamentals of Applied Electromagnetics, 6th or 7th ed.
Author: Ulaby, Michielssen, Ravaiol
Publisher: Pearson / Prentice Hall
Year: 2010 or 2015

Optional Text
Title: Engineering Electromagnetics
Author: W.H. Hayt, J.A. Buck
Publisher: McGraw-Hill
Year: 2006

References:
Course Website: TBA

Assessment:
Assignments: 10 %  Due Dates: TBA
Labs 20 %
Mid-term 20 %  Date: TBA
Final Exam 50 %

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

Lab Requirements
- Labs begin on Monday, 04 May 2015.
- See GENERAL LABORATORY REGULATIONS FOR STUDENTS in the lab manual for details about report requirements.

The final grade obtained from the above marking scheme for the purpose of GPA calculation will be based on the percentage-to-grade point conversion table as listed in the current Undergraduate Calendar.

Assignment of E grade and supplemental examination for this course will be at the discretion of the Course Instructor. The rules for supplemental examinations can be found in the current Undergraduate Calendar.

http://web.uvic.ca/calendar/FACS/UnIn/UARe/Grad.html

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 Chair of the Department by email or the Chair's Secretary to set up an appointment.

Accommodation of Religious Observance
http://web.uvic.ca/calendar/GI/GUPo.html

Policy on Inclusivity and Diversity
http://web.uvic.ca/calendar/GI/GUPo.html

Standards of Professional Behaviour
You are advised to read the Faculty of Engineering document Standards for Professional Behaviour in current Undergraduate Calendar, which contains important information regarding conduct in courses, labs, and in the general use of facilities.

Updated April 24, 2015
Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult entry in current Undergraduate Calendar for the UVic policy on academic integrity.

http://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf

Course Lecture Notes

Unless otherwise noted, all course materials supplied to students in this course have been prepared by the instructor and are intended for use in this course only. These materials are NOT to be re-circulated digitally, whether by email or by uploading or copying to websites, or to others not enrolled in this course. Violation of this policy may in some cases constitute a breach of academic integrity as defined in the UVic Calendar.
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Elec. 216
May - August 2015

Introduction week for ALL sections – May 4 - 8
No Labs during week of June 29 – July 3
All Labs take place in Elliott Rm. 129