ELEC 581  Power Electronics

Term – SUMMER 2015 (201505)

Instructor
Dr. Ashoka K.S. Bhat:
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Office Hours
Days: Thursday
Time: 2:30 to 3:30 PM
Location: EOW 413

Course Objectives
- To introduce the basic principles of solid state power conversion and power semiconductor circuits.

Learning Outcomes
- You will learn basic operation and characteristics of power devices (SCR, MOSFET and IGBT), and their use in power converters. You will also learn basic operating principles of ac-to-dc and dc-to-dc converters and dc-to-ac inverters, and how to analyze these converters. Through a project assigned to you, you will learn how to analyze, design and simulate a power electronic converter.

Syllabus
- Introduction, Power semiconductor switches, Review of circuits with switches and diodes, Half-wave rectifier - analysis with R, RC, RL load circuits (including EMF in the load circuit), Half-wave and full-wave controlled rectifiers (single-phase and three-phase), AC voltage controllers (single-phase and three-phase), DC-to-DC converters (type-A, type-B and four quadrant), Switch mode dc-to-dc power converters, dc-to-ac inverters (PWM and resonant, voltage control, multi-level), application examples

A-Section(s):  A01 / CRN 30362
Days: Thursday and Friday
Time: 16:00 to 17:20 PM & 17:00 to 18:20 PM
Location: ECS 130

Required Text
Title: Power Electronics Notes
Author: A.K.S. Bhat
Publisher: Self (will be sent via e-mails)
Year: 2015
References:
1. Selected papers to be provided during the semester.

Assessment:

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Percentage</th>
<th>Due Dates</th>
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</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>5%</td>
<td>Five assignments, given as the course progresses.</td>
</tr>
<tr>
<td>Labs</td>
<td>10%</td>
<td></td>
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<tr>
<td>Mid-term(s) (two)</td>
<td>44%</td>
<td>Date: June 26 and July 17 (to be finalized)</td>
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<tr>
<td>Project</td>
<td>41%</td>
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<tr>
<td>Total</td>
<td>100%</td>
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</tbody>
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Note:
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 Graduate Calendar.

There is no final examination for this course. Project report is equivalent to final examination.

http://web.uvic.ca/calendar/GRAD2015-05/FARe/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.

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.