**Faculty of Engineering**

**COURSE OUTLINE**

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|  | **ELEC 300 – Linear Circuits: II** |  |
|  | **Term – Spring 2018** (201801) |  |
| **Instructor** | **Office Hours** |  |
| Dr. Jens Bornemann | Days: | Mondays, Thursdays |
| Phone: 250-721-8666 | Time: | 15:00 – 16:00 |
| E-mail: | Location: | EOW 309 |

**Course Objectives**

To introduce students to more advanced concepts pertaining to network analysis in the time and frequency domain, including the treatment of active circuits.

**Learning Outcomes**

At the end of the course, students will be able to …

* demonstrate functionality of circuits containing operational amplifiers
* assess the performance of circuits that have time dependent responses
* use Laplace transforms to find the response of linear circuits to time varying inputs
* solve for zero input and forced response as a function of time using node or mesh analysis
* design circuits which have specified transfer functions and meet other specified constraints
* evaluate the frequency response of linear circuits and make straight line Bode gain and phase plots
* design a cascade of active or passive filter circuits to achieve a desired transfer function
* analyze circuits containing coupled inductors and ideal transformers
* evaluate sinusoidal steady state response of linear circuits using phasors
* evaluate two port parameters of linear circuits and find the response of two ports to external input

**Syllabus**

Appr. No of Classes

Introduction …………………….……………………………………………………………………. 1

Basic Circuit Laws (review) ……………………………………………………………………. 2

Operational Amplifiers ……………………………………………………………………………2

Transfer Functions …………………………………………………………………………………. 1

Bode Plots ……………………………………………………………………………………………… 4

Serial and Parallel Resonance ………………………………………………………………… 1

Filters ……………………………………………………………………………………………………. 2

Coupled inductors and transformers …………………………………………………….. 1

Laplace Transforms for Circuits ……………………………………………………………… 4

Two-Port Networks ……………………………………………………………………………….. 4

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| --- | --- |
| Sub Total | 22 |
| Midterm Test | 1 |
| Review | 1 |
| Total | 24 |

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| **Lectures** |  |  | **Labs** | **Location: ELW B324** | |
| **A**-Section(s): | A01 / CRN 21071 |  | **B**-Section(s): Days: | | Time(s): |
| Days: | Mondays & Thursdays |  | B01 | Monday | 16:30-19:20 |
| Time: | 10:00-11:20 |  | B02 | Monday | 16:30-19:20 |
| Location: | HSD A240 |  | B03 | Tuesday | 12:30-15:20 |
|  |  |  | B04 | Tuesday | 12:30-15:20 |
|  |  |  | B05 | Wednesday | 12:30-15:20 |
|  |  |  | B06 | Wednesday | 12:30-15:20 |
|  |  |  | B08 | Friday | 13:30-16:20 |
|  |  |  | Odd-numbered labs begin week of 22 Jan 2018, | | |
|  |  |  | even-numbered labs begin week of 29 Jan 2018 | | |
|  |  |  | (c.f. schedule below). Names and emails of lab | | |
|  |  |  | TAs posted on course website. | |  |
| **Required Text** |  |  | **Optional Text** | |  |
| Title: | Electric Circuits |  | Title: | Fundamentals of Electric Circuits | |
| Author: | J.W Nilsson and S.A. Riedel | | Author: | C.K. Alexander and M.N.O. Sadiku | |
| Publisher: | Pearson |  | Publisher: | McGraw Hill |  |
| Year: | 2015 (10th ed.) |  | Year: | 2007, 2009, 2013 or 2017 (6th ed.) | |
| **References:** | **Couse Website:** | **TBA** |  |  |  |
| **Assessment:** |  |  |  |  |  |
| Assignments: | 10 % | Due Dates: | TBA |  |  |
| Labs | 20 % |  |  |  |  |
| Mid-term | 20 % | Date: | 22 Feb 2018 | |  |
| Final Exam | 50 % |  |  |  |  |

**Note:**

1. Failure to complete all laboratory requirements will result in a grade of N being awarded for the course.
2. The aggregate grade of the midterm and the final exam must be a passing grade to pass the course.

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. <https://web.uvic.ca/calendar2018-01/undergrad/info/regulations/grading.html>

**There will be no supplemental examination for this course.**

**Note to students:** Students who have issues with the conduct of the course should discuss them withthe 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 Assistant to set up an appointment.

**Accommodation of Religious Observance:**

<https://web.uvic.ca/calendar2018-01/undergrad/info/regulations/religious-observanc.html>

**Policy on Inclusivity and Diversity:**

<https://web.uvic.ca/calendar2018-01/general/policies.html>

**Standards of Professional Behaviour:** You are advised to read the Faculty of Engineering documentStandards for Professional Behaviour, which contains important information regarding conduct in

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courses, labs, and in the general use of facilities. <https://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf>

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University

and the Department. You should consult the entry in the current Undergraduate Calendar for the UVic

policy on academic integrity.

<https://web.uvic.ca/calendar2018-01/undergrad/info/regulations/academic-integrity.html>

**Equality:** This course aims to provide equal opportunities and access for all students to enjoy thebenefits and privileges of the class and its curriculum and to meet the syllabus requirements. Reasonable and appropriate accommodation will be made available to students with documented disabilities (physical, mental, learning) in order to give them the opportunity to successfully meet the essential requirements of the course. The accommodation will not alter academic standards or learning outcomes, although the student may be allowed to demonstrate knowledge and skills in a different way. It is not necessary for you to reveal your disability and/or confidential medical information to the course instructor. If you believe that you may require accommodation, the course instructor can provide you with information about confidential resources on campus that can assist you in arranging for appropriate accommodation. Alternatively, you may want to contact the Resource Centre for Students with a Disability located in the Campus Services Building.

The University of Victoria is committed to promoting, providing, and protecting a positive, and supportive and safe learning and working environment for all its members.

**Course Lecture Notes:** Unless otherwise noted, all course materials supplied to students in this coursehave 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.

(Detailed lab schedule as provided by Dan Mai will be added here)

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