ELEC 300 – Linear Circuits: II

Term – Spring 2018 (201801)

Instructor
Dr. Jens Bornemann
Phone: 250-721-8666

Office Hours
Days: Mondays, Thursdays
Time: 15:00 – 16:00
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

| 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 |

Sub Total 22
Midterm Test 1
Review 1
Total 24
Lectures
A-Section(s): A01 / CRN 21071
Days: Mondays & Thursdays
Time: 10:00-11:20
Location: HSD A240

B-Section(s):
B01 Monday 16:30-19:20
B02 Monday 16:30-19:20
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

Location: ELW B324

Labs
Location: ELW B324

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
Title: Electric Circuits
Author: J.W Nilsson and S.A. Riedel
Publisher: Pearson
Year: 2015 (10th ed.)

Optional Text
Title: Fundamentals of Electric Circuits
Author: C.K. Alexander and M.N.O. Sadiku
Publisher: McGraw Hill

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 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 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 document
Standards for Professional Behaviour, which contains important information regarding conduct in

Updated November 17, 2017
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 the benefits 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 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.

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