University of Victoria
Faculty of Engineering | Electrical and Computer Engineering
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COURSE OUTLINE

ECE 250 – Linear Circuits I

SUMMER 2020 (202005)

Instructor

Dr. T. Ilamparithi
Phone: 250-721-8679
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Office Hours

Days: Mondays, Thursdays
Time: 4:00 to 5:00 PM (PDT)
Platform: Zoom (link to be shared via CourseSpace)

Course Objectives

Electric circuits are integral to many modern technologies. Hence, familiarizing the terminologies associated with electric circuits is essential for any upcoming engineer irrespective of one's specialization. For Electrical, Computer and Biomedical engineers the need to work with electric circuits is absolute. Therefore, thorough understanding of the fundamentals along with the ability to analyze and design circuits are mandatory. The objective of the course is

- To introduce the mathematical techniques and application skills needed to analyze, design, and make measurements on linear electric circuits.

Learning Outcomes

By being a part of ECE 250 and by actively involving yourself in the learning process, you shall be able to

- Analyze resistive circuits using Ohm's and Kirchhoff's laws
- Analyze resistive circuits using network theorems as well as mesh-current and node voltage approaches
- Analyze first and second order passive circuits
- Perform AC circuits analysis using phasors
- Assess series and parallel resonance
- Calculate AC power
- Solve 3 phase circuits with wye and delta loads
- Demonstrate communication skills through lab reports

Syllabus

The syllabus comprises of

- Circuit analysis and design techniques. Resistors, sources, Kirchhoff's voltage and current laws. Theorems: linearity, superposition, Thevenin, Norton. Node and mesh analysis. Capacitors and inductors, series and parallel connections, stored energies. Analysis of first- and second-order circuits. Forced and natural responses. Phasors, impedance and admittance. Network theorems using phasors. Series and parallel resonance. RMS quantities, complex power. Maximum power transfer. Three-phase circuits, Y- and Delta-loads.

Lecture

A-Section(s): A01 / CRN 30291
Days: Mondays, Thursdays
Time: 8:30 AM to 09:50 AM (PDT)
Platform: Zoom (Link to be shared via Coursespace)

Tutorial

T-Section : T01/ CRN 30294
Days: Fridays
Time: 12:30 PM to 01:20 PM (PDT)
Platform/link: To be shared via Coursespace

Laboratory
B-Section(s): B02 / CRN 30292 & B04 / CRN 30293
Details will be shared via CourseSpace.

Required Textbook

Title: Electric Circuits (plus Mastering Engineering)
Authors: J.W. Nilsson, S.A. Riedel
Publisher: Pearson (11th Edition)
Year: 2018

Online Course Delivery:
As the course will be conducted online during this term, students will need to complete assignments/tests/labs online. The students will require access to a computer with a monitor of at least 14" size and a high-speed wired internet connection to attend lectures and to participate in all activities associated with the course. In addition, laboratory exercises will be performed virtually using a free online tool called *TinkerCAD Circuits* (https://www.tinkercad.com/). Students are strongly advised to use aliases and create new email addresses to access the tool.

Assessment:

Validating one's learning is important and hence in ECE 250, many opportunities will be provided to you to assess your learning. In order to ensure you have enough time to take appropriate corrective actions upon assessing, I propose the following periodic assessment scheme:

In-class quizzes	5 x 2 = 10%	Dates: To be shared via CourseSpace
Assignments:	10 x 2.5 = 25%	Due Dates: To be shared via CourseSpace
Labs	4 x 4 = 16%	Due Dates: To be shared via CourseSpace
Mid-term	1 x 14 = 14%	Date: 18-June-2020 between 08:30 AM and 09:50 AM (PDT)
Final Exam	1 x 35 = 35%	Date: To be announced later via CourseSpace

I have furnished more details about each of the assessment scheme in Appendix A. Please take time to read through it.

Important: All deadlines and schedules for this course will reference Pacific Daylight Time.

Note:

Failure to complete all laboratory requirements will result in a grade of N being awarded for 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://www.uvic.ca/calendar2020-05/undergrad/index.php#/policy/S1AAgoGuV?bc=true&bcCurrent=14%20-%20Grading&bcItemType=policies

There will be no supplemental examination for this course.

https://www.uvic.ca/calendar2020-05/undergrad/index.php#/policy/SJ2Rxoz_N?bc=true&bcCurrent=13%20-%20Examinations&bcItemType=policies

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.

Course Withdrawal Deadlines:

- May 16, 2020: Withdrawal with 100% reduction of tuition fees
- June 6, 2020: Withdrawal with 50% reduction of tuition fees
- July 1, 2020: Last day for withdrawal (no fees returned)

Accommodation of Religious Observance:
https://www.uvic.ca/calendar2020-05/undergrad/index.php#/policy/r1q0gofdN?bc=true&bcCurrent=10%20-%20Accommodation%20of%20Religious%20Observance&bcItemType=policies

Policy on Inclusivity and Diversity:
Engineering: https://www.uvic.ca/engineering/about/equity/index.php
Academic Calendar: https://www.uvic.ca/calendar2020-05/undergrad/index.php#/policy/HkQ0pzdAN

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

Academic Integrity
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://www.uvic.ca/calendar2020-05/undergrad/index.php#/policy/Sk_0xsM_V?bc=true&bcCurrent=08%20-%20Policy%20on%20Academic%20Integrity&bcItemType=policies

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 an appropriate accommodation. Alternatively, you may want to contact the Centre for Accessible Learning located in the Campus Services Building. https://www.uvic.ca/services/cal/.
The University of Victoria is committed to promoting, providing, and protecting a positive, supportive, and safe learning and working environment for all its members.

Course Lecture Notes:
As a first time learner of electrical circuits, you are encouraged to study from the textbook. Therefore, I shall refrain from providing lecture notes. On the other hand, I shall supply you with a tentative schedule of topics I intend to discuss during lecture hours. I recommend strongly that you spend time reading about the topic both before and after the lecture. Where-ever appropriate, I might supply a few materials that would supplement the text book.
Unless otherwise noted, all course materials supplied to students in this course 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.

Sexualized Violence Prevention and Response at Uvic:
UVic takes sexualized violence seriously, and has raised the bar for what is considered acceptable behaviour. We encourage students to learn more about how the university defines sexualized violence and its overall approach by visiting

www.uvic.ca/svp. If you or someone you know has been impacted by sexualized violence and needs information, advice, and/or support please contact the sexualized violence resource office in Equity and Human Rights (EQHR). Whether or not you have been directly impacted, if you want to take part in the important prevention work taking place on campus, you can also reach out:

Where: Sexualized violence resource office in EQHR; Sedgewick C119
Phone: 250.721.8021
Email: svpcoordinator@uvic.ca
Web: www.uvic.ca/svp

Office of the Ombudsperson:
The Office of the Ombudsperson is an independent and impartial resource to assist with the fair resolution of student issues. A confidential consultation can help you understand your rights and responsibilities. The Ombudsperson can also clarify information, help navigate procedures, assist with problem-solving, facilitate communication, provide feedback on an appeal, investigate and make recommendations. Phone: 250-721-8357; Email: ombuddy@uvic.ca; Web: https://uvicombudsperson.ca/

Course Evaluation: Towards the end of term, as in all other courses at UVic, you will have the opportunity to complete an anonymous survey regarding your learning experience (CES). The survey is vital to providing feedback regarding the course and my teaching, as well as to help the department improve the overall program for students in the future. When it is time for you to complete the survey you will receive an email inviting you to do so. You will need to use your UVic Netlink ID to access the survey, which can be done on your laptop, tablet, or mobile device. I will remind you and provide you with more detailed information nearer the time but please be thinking about this important activity during the course.

Continuous Feedback: I am committed to a memorable learning experience for my students, and I will try my best to help out in whatever way I can. For that I need to receive your input. Oral/written feedback are all welcome anytime during the term.

Appendix A

Assessment:

As indicated in the course outline, I suggest the following periodic assessment scheme:

In-class quizzes	5 x 2 = 10%	Dates: To be shared via CourseSpace
Assignments:	10 x 2.5 = 25%	Due Dates: To be shared via CourseSpace
Labs	4 x 4 = 16%	Due Dates: To be shared via CourseSpace
Mid-term	1 x 14 = 14%	Date: 18-June-2020 between 08:30 AM and 09:50 AM (PDT)
Final Exam	1 x 35 = 35%	Date: To be announced later via CourseSpace

In-class quizzes:

The main objective of the quizzes is to provide instant and frequent feedback about your understanding of the course material. Key information about these quizzes are:

Day: Every Thursday (except 28-May, 18-Jun, 02-Jul)
Time: During lecture hour
Duration: 15 minutes
Type of questions: Multiple choice questions
Restrictions: No discussion with peers
Accommodations: You can refer to any resource such as notes, text book or internet
Calculator: Any type of calculator can be used
Weightage: Each quiz will have 2% weightage

I do understand that you might not be able to appear for all the quizzes. Hence, I shall consider only your best 5 performances towards the grade.

Assignment:

In this course, there will be 10 assignments, almost one for each chapter. Each assignment might have about 5 or 6 questions. You are expected to solve all the problems, scan your solution and upload the scanned pdf file on CourseSpace. You can use your smart phone and free scanning apps to scan the assignments.

While you are expected to solve all the questions of each assignment, due to time and resource constraints, only a few questions will be marked. However, I shall be posting the detailed solution for all the assignment problems three days after the submission deadline. Please note, I shall assign a few marks for legible and methodical presentation just to ensure you present your answers in a professional manner. In case you find any issue with the way your assignment is marked, please do not hesitate to contact me via email.

Lab:

In this course, there are a few experiments that you need to complete. For most of the experiments, you will building the circuits on a virtual breadboard using a free online tool called *TinkerCAD circuits* (www.tinkercad.com). You are expected to create an account with Autodesk TinkerCAD. You are encouraged to use aliases and new email addresses to access these tools. For a few experiments where virtual prototyping is not possible, videos will be uploaded. You will be expected to watch the videos and complete the lab reports.

Midterm:

Midterm exam will help you review all topics covered in the first month of the term. Some useful information about the midterm exam are given below:

Date: 18-Jun-2020
Time: During lecture hour
Duration: 1hour 15 minutes
Type of questions: Descriptive type
Restrictions: No discussion with peers.
Accommodations: Access to textbook, internet or other resources
Calculator: Any type of calculator can be used

Weightage: Midterm exam will be worth 14%

Please note, you are expected to scan your answer sheet and upload it on CourseSpace. Scanning can be done using free apps custom made for modern smart phones. I shall assign a few marks for legible and methodical presentation just to ensure you present your answers in a professional manner.

Final Exam:

The final exam for the course will be comprehensive in nature. The exact details about the final exam will be shared via CourseSpace around mid-July.