

COURSE OUTLINE

ECE 330 – Electronic Circuits I

Term –SPRING 2021 (202101)

Instructor

Dr. Sana Shuja
E-mail: sanashuja@uvic.ca

Office Hours

Days: Thursdays
Time: 12:00 pm – 1:00 pm
Platform: Zoom

Course Objectives

This course introduces and describes the physical characteristics and operation of the major semiconductor devices and illustrates how the device characteristics are utilized in switching, more importantly for the construction of voltage amplifiers. The prime objective of the course is to build the foundation concepts required for advanced analogue and power design applications.

Learning Outcomes

- Design a single-stage voltage amplifier which meets a set of given specifications
- Describe the operating modes of transistors and their applications
- Apply appropriate diode and transistor models in order to solve circuits
- Describe the use of diodes in power rectification and signal conditioning
- Employ LT SPICE software for designing and simulating circuits
- Construct diode and transistor circuits and diagnose their faults

Syllabus

- Semiconductor material and properties.
- Diode model, equivalent model and circuit analysis.
- Analysis of diode-based circuits (rectifiers, clipper, clampers, etc.)
- Special diodes characteristics and applications.
- Bipolar transistors characteristics and modes of operations.
- DC analysis, dc load line, biasing of bipolar transistor circuits.
- Small signal analysis of bipolar transistor circuits.
- Design and analysis of common transistor amplifiers.
- Field Effect Transistors characteristics and modes of operations.

A-Section(s): A01 / CRN 20889

Days: Tuesday and Wednesday

Time: 11:30 am - 12:20 pm

Link: <https://bright.uvic.ca/d2l/home/53359>

| Labs | Day | Time | Dates | Link |
|------|-----|-------------------|-----------------------------------|---|
| B02 | Mon | 1:30 pm - 4:20 pm | Feb 1, Feb 22, March 8, March 22 | https://bright.uvic.ca/d2l/home/55908 |
| B04 | Wed | 1:00 pm - 3:50 pm | Feb 3, Feb 24, March 10, March 24 | https://bright.uvic.ca/d2l/home/52066 |
| B06 | Tue | 1:30 pm - 4:20 pm | Feb 2, Feb 23, March 9, March 23 | https://bright.uvic.ca/d2l/home/56738 |
| B08 | Tue | 4:30 pm - 7:20 pm | Feb 2, Feb 23, March 9, March 23 | https://bright.uvic.ca/d2l/home/51616 |
| B10 | Thu | 3:30 pm - 6:20 pm | Feb 4, Feb 25, March 11, March 25 | https://bright.uvic.ca/d2l/home/51519 |

Required Textbook

Title: Microelectronic Circuits, 8th edition
Author: A.S. Sedra, K.C. Smith
Publisher: Oxford University Press
Year: 2020

Optional Textbook

Title: Electronic Devices and Circuits
Author: Theodore F. Bogart, Jeffrey S. Beasley
Publisher: Pearson
Year: 2003

Lab Manual

Available in Brightspace

Online Course Delivery:

As this course will be conducted online during this term, students will need to complete assignments/labs online. The students will require access to a computer which has the following software installed: Web Browser, Zoom, LTSpice

Assessment:

| | | |
|--------------|-----|-------------------------------------|
| Assignments: | 20% | Due Dates: Feb 01, Feb 22, March 15 |
| Quiz | 5% | Will be announced a week before |
| Labs | 15% | |
| Mid-term | 20% | Date: Feb 23 |
| Final Exam | 40% | |

Important: All deadlines and schedules for this course will reference Pacific Standard Time until March 14, 2021 and then 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/calendar/archives/202101/undergrad/index.php#/policy/S1AAgoGuV?bc=true&bcCurrent=14%20-%20Grading&bcGroup=Undergraduate%20Academic%20Regulations&bcltemType=policies>

Assignment of an 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.

https://www.uvic.ca/calendar/archives/202101/undergrad/index.php#/policy/SJ2Rxoz_N?bc=true&bcCurrent=13%20-%20Examinations&bcGroup=Undergraduate%20Academic%20Regulations&bcltemType=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:

- January 19, 2021: Withdrawal with 100% reduction of tuition fees (under review)
- February 9, 2021: Withdrawal with 50% reduction of tuition fees (under review)
- February 28, 2021: Last day for withdrawal (no fees returned) (under review)

Accommodation of Religious Observance:

<https://www.uvic.ca/calendar/archives/202101/undergrad/index.php#/policy/r1q0gofdN?bc=true&bcCurrent=10%20-%20Accommodation%20of%20Religious%20Observance&bcltemType=policies>

Policy on Inclusivity and Diversity:

Engineering: <https://www.uvic.ca/engineering/about/equity/index.php>

Academic Calendar:

<https://www.uvic.ca/calendar/archives/202101/undergrad/index.php#/policy/HkQ0pzdAN?bc=true&bcCurrent=%20General%20University%20Policies&bcGroup=General%20University%20Policies&bcltemType=policies>

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/calendar/archives/202101/undergrad/index.php#/policy/Sk_0xsM_V?bc=true&bcCurrent=08%20-%20Policy%20on%20Academic%20Integrity&bcltemType=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:

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.

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](https://uvicombudsperson.ca/) 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, Website: <https://uvicombudsperson.ca/>