
ECE 412 – Electronic Devices: II

Term – Summer 2019 (201905)

Instructor

Dr. H.L. Kwok
Phone: 721-8685
E-mail: harry.kwok@ece.uvic.ca

Office Hours

Days: Thursdays
Time: 12:50-13:50
Location: EOW425/ECS124

Course Objectives

- This course deals with the principle of operation and design issues related to modern electronic devices. The advancement of electronics has been primarily due to the invention of new devices and it is desirable for practicing engineers to have an updated perspective and understanding on state-of-the-art electronic devices and the future trends.

Learning Outcomes

- LO-1: Study the operation of advanced bipolar and field-effect transistors
- SLO-1.1: Examine the state-of-the-art of advanced transistors, their performance and operation in the context of Very-Large Scale Integration Circuits
-
- LO-2: Study the operation of novel photonic and opto-electronic devices
-
- LO-3: Study the operation of non-conventional semiconductor devices and their future trends
-
- LO-4: Study the principles, construction and design of semiconductor lasers and related applications
-
- LO-5: Study the operation of state-of-the-art display devices; thin-film devices; imaging devices; energy conversion devices; transducers; and micro-machines and their interfacing

Syllabus

- Topics to cover:

- a. Operation of bipolar and field-effect devices in VLSI design
- b. Photonic and optoelectronic devices
- c. Organic semiconductor devices and their upcoming trends
- d. Principles, construction and design of lasers and related light sources
- e. Display devices, thin-film devices, imaging devices, transducers and micro-machines
- f. Interfacing, sensor arrays and related system-level design

-

A-Section(s): A01 / CRN 31521

Days: MT
Time: 11:30-12:50
Location: ECS124

Required Text

Title: Electronic Materials
Author: H. Kwok
Publisher: Trans Tech Publishing
Year: 2010

Optional Text

Title: Physics of Semiconductor Devices
Author: M. Shur
Publisher: Prentice-Hall
Year: 1990

References:

Title: Semiconductor Devices, Physics and Technology
Author: S.M. Sze
Publisher: J. Wiley
Year: 1985

Assessment:

Assignments:	10%	Due Dates: One week after homework is assigned
Mid-terms (2-3)	60%	Date: May 27; June 27 and/or July 11
Final Exam	30%	

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 Undergraduate Calendar.

<https://web.uvic.ca/calendar2019-05/undergrad/info/regulations/grading.html>

There will be no supplemental examination for this course.

<https://web.uvic.ca/calendar2019-05/undergrad/info/regulations/exams.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 Assistant to set up an appointment.

Accommodation of Religious Observance:

<https://web.uvic.ca/calendar2019-05/undergrad/info/regulations/religious-observanc.html>

Policy on Inclusivity and Diversity:

<https://web.uvic.ca/calendar2019-05/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 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/calendar2019-05/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.

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