



# Department of Electrical and Computer Engineering

## COURSE OUTLINE

### **ECE 549A Selected Topics in Electronics - Photovoltaics Spring 2019 (201901)**

#### **Instructor**

Dr. Chris Papadopoulos  
Phone: 250-721-8619  
E-mail: papadop@ece.uvic.ca

#### **Office Hours**

Day: Tuesday      Time: 2:30PM – 5:00PM  
(or by appointment)  
Location: EOW 429

#### **Lectures**

Section: A01 / CRN 23790  
Day: W  
Time: 2:30PM – 5:20PM  
Location: ELL 162

#### **Website**

<http://coursespaces.uvic.ca/> (NetLink ID required)

#### **Required Text**

Readings will be provided.

#### **Reference texts**

*Photovoltaic Solar Energy Generation*, Lotsch *et al.*, Springer (2005) (e-book available via library).

*Physics of Semiconductor Devices*, Sze and Ng, Wiley (2007) (standard reference on devices).

*Solar Energy*, Isabella *et al.*, UIT Cambridge (2016) (Kindle edition available via Amazon).

#### **Topics**

- I      Review of Electronic Materials and Devices
- II     Operating Principles of Solar Cells
- III    Conventional Solar Cells
- IV    Emerging Photovoltaic Technologies
- V     Photovoltaic Systems

#### **Assessment**

Tests	2 x 25% (Take home, due Feb. 13; Mar. 13)
Term Paper	40% (Due Apr. 5) + 10% Seminar (In-class, Apr. 3)

Submit all work directly to instructor (in-class or office by 5PM). Term papers will not be accepted after the due date.

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 listed in the current Graduate Calendar:  
<https://web.uvic.ca/calendar2019-01/grad/academic-regulations/grading.html>

### **Course Objectives and Learning Outcomes**

Understand and apply principles of operation and design of modern photovoltaic device technology:  
(i) Equations describing device operation; (ii) Appropriate models; (iii) Factors that determine performance.

### **Syllabus**

Photovoltaic materials and device technology. Operating principles of solar cells: Charge excitation, separation and collection. Standard and emerging photovoltaic technologies. Conversion efficiencies, loss mechanisms, systems and manufacturing costs. Photovoltaic technology in the context of worldwide energy demand.

### **Accommodation of Religious Observance:**

<http://web.uvic.ca/calendar2019-01/grad/registration/Registration.1.17.html>

### **Policy on Inclusivity and Diversity:**

<http://web.uvic.ca/calendar2019-01/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 courses, labs, and in the general use of facilities:  
<http://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf>

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.

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 Graduate Calendar for the UVic policy on academic integrity:  
<http://web.uvic.ca/calendar2019-01/grad/academic-regulations/academic-integrity.html>

### **Sexualized Violence Prevention and Response at UVic**

UVic takes sexualized violence seriously and we encourage students to learn more about how the university defines sexualized violence and its overall approach by visiting [www.uvic.ca/svp](http://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: [svpcordinator@uvic.ca](mailto:svpcordinator@uvic.ca); Web: [www.uvic.ca/svp](http://www.uvic.ca/svp)

### **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 Materials**

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, which could in some cases constitute a breach of academic integrity as defined in the UVic Calendar.