

## COURSE OUTLINE

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### ECE 216 – Electricity and Magnetism

Term – FALL 2019 (201909)

CourseSpaces – <https://coursespaces.uvic.ca/course/view.php?id=65330>

<b>Instructor</b>	<b>Dr. P. So</b>	<b>Office Hours</b>
Phone:	250-472-4224	Days: Tuesday and Wednesday
E-mail:	Poman.So@UVic.CA	Time: 13:30 — 14:30
		Location: EOW 417

#### Course Objectives

Study the fundamentals of electromagnetics with emphasis on engineering applications.

#### Learning Outcomes

Upon completion of this course, students should be able to:

1. Evaluate the gradient of a scalar function and the divergence and curl of a vector function in any of the three primary coordinate systems.
2. Apply Coulomb's Law, Biot-Savart Law, Gauss' Law, Faraday's Law, Lenz's Law, Lorentz Force, Ampère's Law, and Maxwell's Equations to solve electromagnetic problems.
3. Evaluate the magnetic force and torque on a current-carrying structure due to a magnetic field.
4. Calculate the resistance, capacitance, and inductance of electromagnetic structures.
5. Use Maxwell's Equations to assess the propagation characteristics of plane waves.
6. Solve transmission-line problems.

#### Syllabus

Electric charge, Coulomb's Law, electrostatic forces, electric field, Gauss's Law, electric potential, stored energy. Electric current, conduction in a vacuum and in material media, displacement current, magnetic field of a current, force on a current carrying wire, magnetic induction, electromotive force, energy stored in a magnetic field. Magnetism and magnetic circuits. Time varying fields. Capacitance, resistance, inductance, and their characterization.

#### A-Section: A01 / CRN 10877

Days: TWF  
Time: 12:30 — 13:20  
Location: ELL 060

#### B-Sections (Laboratory)

See the [online class schedule](#) for details

**T-Section (Tutorial):** T01, Monday, 3:30 – 4:20, CLE A203

#### Required Textbook

Title: Fundamentals of Applied Electromagnetics, 7ed (or 8ed)  
Author: Fawwaz T. Ulaby and Umberto Ravaioli  
Publisher: Pearson / Prentice Hall  
Year: 2015

**Assessment:**

Assignments:	10% (10 × 1%)	Due Dates:	TBA, see CourseSpaces for details
Labs:	20% ( 5 × 4%)		
Exams:	70% (15%, 20%, 20%, 15%)	Dates:	Wednesdays 25/09, 16/10, 6/11 and 4/12
			Students must bring their UVic OneCard to the exams

**Note:**

1. The required textbook is your main source of reference for this course. Material in the book will not be reproduced in the course notes. Students are required to take their own notes.
2. Students are required to attend all lectures.  
See <http://web.uvic.ca/calendar2019-09/undergrad/info/regulations/attendance.html> for attendance requirements.
3. Failure to complete all laboratory requirements will result in a grade of N being awarded for the course.
4. The aggregate grade of the exams 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/calendar2019-09/undergrad/info/regulations/grading.html>

**There will be no supplemental examination for this course.**

<https://web.uvic.ca/calendar2019-09/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.

**Course Withdrawal Deadlines:**

- September 17: Withdrawal with 100% reduction of tuition fees
- October 8: Withdrawal with 50% reduction of tuition fees
- October 31: Last day for withdrawal (no fees returned)

**Accommodation of Religious Observance:**

<https://web.uvic.ca/calendar2019-09/undergrad/info/regulations/religious-observanc.html>

**Policy on Inclusivity and Diversity:**

<https://web.uvic.ca/calendar2019-09/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/calendar2019-09/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 an appropriate accommodation. Alternatively, you may want to contact the Centre for Accessible Learning located in the Campus Services Building.

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](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:** [svpcoordinator@uvic.ca](mailto:svpcoordinator@uvic.ca)

**Web:** [www.uvic.ca/svp](http://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](mailto:ombuddy@uvic.ca); Web: <https://uvicombudsperson.ca/>