University of Victoria Engineering

Faculty of Engineering

COURSE OUTLINE

ELEC 340 – Applied Electromagnetics and Photonics

Term – Spring 2017 (201701)

CourseSpaces – http://coursespaces.uvic.ca/course/view.php?id=21740

Instructor

Dr. Poman So
Phone: 250-472-4224
E-mail: Poman.So@UVic.CA

Office Hours

Days: Tuesday and Wednesday
Time: Appointment via email
Location: EOW 417

Course Objectives

Study electromagnetic and photonic theory as well as their applications in engineering.

Learning Outcomes

a. Describe mathematically the electric and magnetic fields of TEM waves.
b. Describe the propagation parameters of a wave to the constitutive parameters of the medium.
c. Describe wave propagation in a rectangular waveguide.
d. State the resonant modes inside a rectangular cavity.
e. State the basic operation of photonic structures.
f. State the electric and magnetic fields of waves radiated by a dipole antenna.
g. State the Doppler frequency shift observed by a radar.
h. Identify the basic operation of satellite communication systems.
i. Evaluate the rate of power carried by an EM wave in both lossless and lossy media.
j. Design electromagnetic structures for polarization of electromagnetic waves.
k. Design electromagnetic structures to optimize transmission behavior of plane-waves incident upon plane boundaries, for both normal and oblique incidences.

Syllabus

Field concept, Maxwell's equations, power, and energy. Plane wave propagation, polarization, and reflection and transmission at material interfaces. Introduction to waveguides, antennas, and photonic structures. Engineering electromagnetics design concepts and examples with emphasis on impedance transformers and shielding structures.

A-Sections: A01 (02) / CRN 21155 (21156)
Days: TWF
Time: 12:30 – 13:20
Location: ELL 168

B-Sections: B01–B06, and B08–B09
See the class schedule listing at the end of this course outline for details
Location: ELW A309

Required Text

Title: Fundamentals of Applied Electromagnetics, 7ed, ISBN-10: 0-13-335681-7
Author: Fawwaz T. Ulaby and Umberto Ravaioli
Publisher: Pearson / Prentice Hall
Year: 2015

Assessment

Assignments:	10%	Due Dates:	See CourseSpaces for details
Labs:	20%		
Mid-term:	10%	Date:	Tuesday February 21, 2017.
Final Exam:	60%		

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 expected to attend all classes in this course and to take their own notes. See http://web.uvic.ca/calendar2017-01/undergrad/info/regulations/attendance.html for attendance requirements.
2. Failure to complete all laboratory requirements will result in a grade of N being awarded for the course.
3. Failure to pass the final exam may result in a failing grade, `min{45%, above assessment}`, for the course.
4. Plagiarism detection software may be used to aid the instructor and/or TAs in the review and grading of some or all of the work you submit (http://library.uvic.ca/instruction/cite/plagiarism.html)

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.

There will be no supplemental examination for this course.

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 Secretary to set up an appointment.

Accommodation of Religious Observance: http://web.uvic.ca/calendar2017-01/general/policies.html

Policy on Inclusivity and Diversity: http://web.uvic.ca/calendar2017-01/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. 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.
http://web.uvic.ca/calendar2017-01/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.

Class Schedule Listing

Second Term: Jan - Apr 2017
Dec 14, 2016

Sections Found

Applied Electromagnetics and Photonics - 21155 - ELEC 340 - A01

Reserved for Bachelor of Engineering students.
Associated Term: Second Term: Jan - Apr 2017
Registration Dates: Jun 13, 2016 to Jan 20, 2017
Levels: Graduate, Law, Undergraduate

Main Campus
Lecture Schedule Type
Face to Face Instructional Method
1.500 Credits
View Catalog Entry

Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	12:30 pm - 1:20 pm	TWF	Elliott Building 168	Jan 04, 2017 - Apr 04, 2017	Lecture	Poman Pok Man So (P)

Applied Electromagnetics and Photonics - 21156 - ELEC 340 - A02

Not open to Bachelor of Engineering students.
Associated Term: Second Term: Jan - Apr 2017
Registration Dates: Jun 13, 2016 to Jan 20, 2017
Levels: Graduate, Law, Undergraduate

Main Campus
Lecture Schedule Type
Face to Face Instructional Method
1.500 Credits
View Catalog Entry

Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	12:30 pm - 1:20 pm	TWF	Elliott Building 168	Jan 04, 2017 - Apr 04, 2017	Lecture	Poman Pok Man So (P)

Applied Electromagnetics and Photonics - 21157 - ELEC 340 - B01

ELEC340 labs meet on alternate weeks.
Associated Term: Second Term: Jan - Apr 2017
Registration Dates: Jun 13, 2016 to Jan 20, 2017
Levels: Graduate, Law, Undergraduate

Main Campus
Lab Schedule Type

Face to Face Instructional Method
0.000 Credits
View Catalog Entry

Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	4:00 pm - 6:50 pm	M	Engineering Lab Wing A309	Jan 23, 2017 - Jan 23, 2017	Lab	TBA
Every Week	4:00 pm - 6:50 pm	M	Engineering Lab Wing A309	Feb 06, 2017 - Feb 06, 2017	Lab	TBA
Every Week	4:00 pm - 6:50 pm	M	Engineering Lab Wing A309	Feb 27, 2017 - Feb 27, 2017	Lab	TBA
Every Week	4:00 pm - 6:50 pm	M	Engineering Lab Wing A309	Mar 13, 2017 - Mar 13, 2017	Lab	TBA

Applied Electromagnetics and Photonics - 21158 - ELEC 340 - B02

ELEC340 labs meet on alternate weeks.
Associated Term: Second Term: Jan - Apr 2017
Registration Dates: Jun 13, 2016 to Jan 20, 2017
Levels: Graduate, Law, Undergraduate

Main Campus
Lab Schedule Type
Face to Face Instructional Method
0.000 Credits
View Catalog Entry

Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	4:00 pm - 6:50 pm	M	Engineering Lab Wing A309	Jan 30, 2017 - Jan 30, 2017	Lab	TBA
Every Week	4:00 pm - 6:50 pm	M	Engineering Lab Wing A309	Feb 20, 2017 - Feb 20, 2017	Lab	TBA
Every Week	4:00 pm - 6:50 pm	M	Engineering Lab Wing A309	Mar 06, 2017 - Mar 06, 2017	Lab	TBA
Every Week	4:00 pm - 6:50 pm	M	Engineering Lab Wing A309	Mar 20, 2017 - Mar 20, 2017	Lab	TBA

Applied Electromagnetics and Photonics - 21159 - ELEC 340 - B03

ELEC340 labs meet on alternate weeks.
Associated Term: Second Term: Jan - Apr 2017
Registration Dates: Jun 13, 2016 to Jan 20, 2017
Levels: Graduate, Law, Undergraduate

Main Campus
Lab Schedule Type
Face to Face Instructional Method
0.000 Credits
View Catalog Entry

Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	1:30 pm - 4:20 pm	W	Engineering Lab Wing A309	Jan 25, 2017 - Jan 25, 2017	Lab	TBA
Every Week	1:30 pm - 4:20 pm	W	Engineering Lab Wing A309	Feb 08, 2017 - Feb 08, 2017	Lab	TBA
Every Week	1:30 pm - 4:20 pm	W	Engineering Lab Wing A309	Mar 01, 2017 - Mar 01, 2017	Lab	TBA
Every Week	1:30 pm - 4:20 pm	W	Engineering Lab Wing A309	Mar 15, 2017 - Mar 15, 2017	Lab	TBA

Applied Electromagnetics and Photonics - 21160 - ELEC 340 - B04

ELEC340 labs meet on alternate weeks.
Associated Term: Second Term: Jan - Apr 2017
Registration Dates: Jun 13, 2016 to Jan 20, 2017
Levels: Graduate, Law, Undergraduate

Main Campus
Lab Schedule Type
Face to Face Instructional Method
0.000 Credits
View Catalog Entry

Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	1:30 pm - 4:20 pm	W	Engineering Lab Wing A309	Feb 01, 2017 - Feb 01, 2017	Lab	TBA
Every Week	1:30 pm - 4:20 pm	W	Engineering Lab Wing A309	Feb 22, 2017 - Feb 22, 2017	Lab	TBA
Every Week	1:30 pm - 4:20 pm	W	Engineering Lab Wing A309	Mar 08, 2017 - Mar 08, 2017	Lab	TBA
Every Week	1:30 pm - 4:20 pm	W	Engineering Lab Wing A309	Mar 22, 2017 - Mar 22, 2017	Lab	TBA

Applied Electromagnetics and Photonics - 21161 - ELEC 340 - B05

ELEC340 labs meet on alternate weeks.
Associated Term: Second Term: Jan - Apr 2017
Registration Dates: Jun 13, 2016 to Jan 20, 2017
Levels: Graduate, Law, Undergraduate

Main Campus
Lab Schedule Type
Face to Face Instructional Method
0.000 Credits
View Catalog Entry

Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	1:30 pm - 4:20 pm	F	Engineering Lab Wing A309	Jan 27, 2017 - Jan 27, 2017	Lab	TBA

Every Week	1:30 pm - 4:20 pm	F	Engineering Lab Wing A309	Feb 10, 2017 - Feb 10, 2017	Lab	TBA
Every Week	1:30 pm - 4:20 pm	F	Engineering Lab Wing A309	Mar 03, 2017 - Mar 03, 2017	Lab	TBA
Every Week	1:30 pm - 4:20 pm	F	Engineering Lab Wing A309	Mar 17, 2017 - Mar 17, 2017	Lab	TBA

Applied Electromagnetics and Photonics - 21162 - ELEC 340 - B06

ELEC340 labs meet on alternate weeks.
Associated Term: Second Term: Jan - Apr 2017
Registration Dates: Jun 13, 2016 to Jan 20, 2017
Levels: Graduate, Law, Undergraduate

Main Campus
Lab Schedule Type
Face to Face Instructional Method
0.000 Credits
View Catalog Entry

Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	1:30 pm - 4:20 pm	F	Engineering Lab Wing A309	Feb 03, 2017 - Feb 03, 2017	Lab	TBA
Every Week	1:30 pm - 4:20 pm	F	Engineering Lab Wing A309	Feb 24, 2017 - Feb 24, 2017	Lab	TBA
Every Week	1:30 pm - 4:20 pm	F	Engineering Lab Wing A309	Mar 10, 2017 - Mar 10, 2017	Lab	TBA
Every Week	1:30 pm - 4:20 pm	F	Engineering Lab Wing A309	Mar 24, 2017 - Mar 24, 2017	Lab	TBA

Applied Electromagnetics and Photonics - 21164 - ELEC 340 - B08

ELEC340 labs meet on alternate weeks.
Associated Term: Second Term: Jan - Apr 2017
Registration Dates: Jun 13, 2016 to Jan 20, 2017
Levels: Graduate, Law, Undergraduate

Main Campus
Lab Schedule Type
Face to Face Instructional Method
0.000 Credits
View Catalog Entry

Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	4:30 pm - 7:20 pm	T	Engineering Lab Wing A309	Jan 31, 2017 - Jan 31, 2017	Lab	TBA
Every Week	4:30 pm - 7:20 pm	T	Engineering Lab Wing A309	Feb 21, 2017 - Feb 21, 2017	Lab	TBA
Every Week	4:30 pm - 7:20 pm	T	Engineering Lab Wing A309	Mar 07, 2017 - Mar 07, 2017	Lab	TBA

Every Week	4:30 pm - 7:20 pm	T	Engineering Lab Wing A309	Mar 21, 2017 - Mar 21, 2017	Lab	TBA

Applied Electromagnetics and Photonics - 24043 - ELEC 340 - B09

Associated Term: Second Term: Jan - Apr 2017
Registration Dates: Jun 13, 2016 to Jan 20, 2017
Levels: Graduate, Law, Undergraduate

Main Campus
Lab Schedule Type
Face to Face Instructional Method
0.000 Credits
View Catalog Entry

Scheduled Meeting Times

Type	Time	Days	Where	Date Range	Schedule Type	Instructors
Every Week	4:00 pm - 6:50 pm	Th	Engineering Lab Wing A309	Jan 26, 2017 - Jan 26, 2017	Lab	TBA
Every Week	4:00 pm - 6:50 pm	Th	Engineering Lab Wing A309	Feb 09, 2017 - Feb 09, 2017	Lab	TBA
Every Week	4:00 pm - 6:50 pm	Th	Engineering Lab Wing A309	Mar 02, 2017 - Mar 02, 2017	Lab	TBA
Every Week	4:00 pm - 6:50 pm	Th	Engineering Lab Wing A309	Mar 16, 2017 - Mar 16, 2017	Lab	TBA