University of Victoria Engineering

Faculty of Engineering

COURSE OUTLINE

ELEC 522 – Antennas and Propagation

Term – SPRING 2016 (201601)

Instructor

Dr. Jens Bornemann

Phone: 250-721-8666

E-mail:

Office Hours

Days: Mondays and Thursdays

Time: 15:00-16:00

Location: EOW 309

Course Objectives

- To introduce students to fundamental radiation, propagation and antenna concepts
- To familiarize students with the terminology used in antenna engineering
- To expose students to basic analysis and design aspects

Learning Outcomes

At the end of the course, students will be able to …

- identify fundamental parameters as they apply to antennas and propagation
- evaluate the influences of reflection, diffraction, fading, scattering, absorption
- carry out link budget calculations in the presence of a variety of losses and obstacles
- design straight wire antennas, loop antennas and helical antennas
- identify the fundamental concepts and limitations of antenna arrays
- design broadside, endfire and phased-array antennas
- design sectoral, pyramidal and conical horn antennas
- design rectangular and circular patch antennas including their feeding networks
- solve the characteristic properties of reflector antennas
- design simple reflector antennas
- apply fundamental concepts to detect possible errors in calculations
- apply the limits of radiation in the microwave spectrum
- understand and explain the fundamental electromagnetic principles (and their limitations) as applied to the material presented in the course

Syllabus

		Approx. No. Classes
1.	Introduction	1
2.	Fundamental Parameters of Antennas and Propagation	3
3.	Propagation	2
4.	Potential Functions	1
5.	Wire Antennas	3
6.	Antenna Arrays	2

7.	Aperture and Horn Antennas	2
8.	Microstrip Antennas	3
9.	Reflector Antennas	1
10.	Ultra-Wideband Antennas	1
11.	Corrugated Horns	1
12.	Antenna Measurements	1
	Mid-term test	1
	Review	1
	Total	23

A-Section(s): A01 / CRN 21182
A02 / CRN 21183
Days: Mondays & Thursdays
Time: 13:00-14:20
Location: ELL 160

Required Text

Title: Antenna Theory: Analysis and Design, 2nd or 3rd Ed.
Author: C.A. Balanis
Publisher: J. Wiley & Sons
Year: 1997 or 2005

Optional Text

Title: Antenna Theory and Design 2nd or 3rd Ed.
Author: W.L. Strutzman and G.A. Thiele
Publisher: J. Wiley & Sons
Year: 1998 or 2012

References: Course Website: TBA

Assessment:

Assignments:	10 %	Due Dates:	TBA; full marks for reasonable effort
Mid-term	30 %	Date:	22 Feb 2016
Project	10 %		
Final Exam	50 %		

Note:

1. Students failing the mid-term test (less than 15 out of 30) will be evaluated by a scheme, which adds the percentage of the test to that of the final exam. This procedure will also be generally adopted for assignments and the midterm test if it results in a higher percentage for the student.
2. Students earning less than 45% (less than 27 out of 60) in the final exam will fail the course.
3. Failure to complete all project 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 Graduate Calendar.

http://web.uvic.ca/calendar/GRAD/FARe/Grad.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 Secretary to set up an appointment.

Accommodation of Religious Observance
http://web.uvic.ca/calendar/GI/GUPo.html

Policy on Inclusivity and Diversity
http://web.uvic.ca/calendar/GI/GUPo.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

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 Graduate Calendar for the UVic policy on academic integrity.

http://web.uvic.ca/calendar/FACS/UnIn/UARe/PoAcI.html

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.