

## COURSE OUTLINE

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### ECE 522 – Antennas and Propagation

Term – SPRING 2021 (202101)

#### Instructor

Dr. Jens Bornemann  
Phone: 250-721-8666  
E-mail: [jbornema@ece.uvic.ca](mailto:jbornema@ece.uvic.ca)

#### Office Hours

Days: Mondays, Thursdays  
Time: 14:30 – 15:30  
Location/Platform/link:  
<https://uvic.zoom.us/j/87829400180?pwd=bDBJczVvUlllQVtNTBYbHVwclordz09>

#### 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 ...

1. evaluate the influences of reflection, diffraction, fading, scattering, absorption
2. examine link budget calculations in the presence of a variety of losses and obstacles
3. design straight wire antennas, loop antennas and helical antennas
4. design broadside, endfire and phased-array antennas
5. design sectoral, pyramidal and conical horn antennas
6. design rectangular and circular patch antennas including their feeding networks
7. design simple reflector antennas
8. understand the fundamental electromagnetic principles (and their limitations) as applied to the course material

#### 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	3
8.	Microstrip Antennas	3
9.	Reflector Antennas	1
10.	Ultra-Wideband Antennas	1
11.	Corrugated Horns	1
12.	Antenna Measurements	1
	<i>Mid-term test</i>	1
	<i>Review</i>	1
	Total	24

A-Section(s): A01 / CRN 20941 A02 / CRN 20942

Days: Mondays & Thursdays

Time: 13:00-14:20

Location/Platform/link: <https://uvic.zoom.us/j/81768675436?pwd=OVBMQkVmVUZieGYzV2JBMVJjZWcwQT09>

#### Required Textbook

Title: Antenna Theory: Analysis and Design, 2<sup>nd</sup>, 3<sup>rd</sup> or 4<sup>th</sup> Ed.

Author: C.A. Balanis

Publisher: J. Wiley & Sons

Year: 1997, 2005 or 2016

#### Optional Textbook

Title: Antenna Theory and Design 2<sup>nd</sup> or 3<sup>rd</sup> Ed.

Author: W.L. Strutzman and G.A. Thiele

Publisher: J. Wiley & Sons

Year: 1998 or 2012

#### Online Course Delivery:

As this course will be conducted online during this term, students will need to submit assignments online.

References: Course Website: Brightspace

#### Assessment:

Assignments:	10 %	Due Dates:	TBA	Marker:	Alireza Seyfollahi <aliseyf(at)uvic(dot)ca>
Mid-term	30 %	Date:	25 Feb 2021		
Project	10 %	Due Dates:	TBA		
Final Exam	50 %				

**Important: All deadlines and schedules for this course will reference Pacific Standard Time until March 14, 2021 and then Pacific Daylight Time.**

**Note:** 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.

<https://www.uvic.ca/calendar/archives/202101/grad/index.php#/policy/B13jeiMdE?bc=true&bcCurrent=07%20-%20Grading&bcltemType=policies>

#### 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.

#### Course Withdrawal Deadlines:

- January 19, 2021: Withdrawal with 100% reduction of tuition fees (under review)
- February 9, 2021: Withdrawal with 50% reduction of tuition fees (under review)
- February 28, 2021: Last day for withdrawal (no fees returned) (under review)

#### Accommodation of Religious Observance:

<https://www.uvic.ca/calendar/archives/202101/grad/index.php#/policy/SkmigiMOV?bc=true&bcCurrent=17%20-%20Accommodation%20of%20Religious%20Observance&bcltemType=policies>

#### Policy on Inclusivity and Diversity:

Engineering: <https://www.uvic.ca/engineering/about/equity/index.php>

Academic Calendar:

<https://www.uvic.ca/calendar/archives/202101/grad/index.php#/policy/HkQ0pzdAN?bc=true&bcCurrent=%20General%20University%20Policies&bcGroup=General%20University%20Policies&bcItem=policies>

### **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>

### **Academic Integrity:**

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.

[https://www.uvic.ca/calendar/archives/202101/grad/index.php#/policy/BJujesM\\_E?bc=true&bcCurrent=02%20-%20Policy%20on%20Academic%20Integrity&bcItem=policies](https://www.uvic.ca/calendar/archives/202101/grad/index.php#/policy/BJujesM_E?bc=true&bcCurrent=02%20-%20Policy%20on%20Academic%20Integrity&bcItem=policies)  
[https://www.uvic.ca/calendar/archives/202101/grad/index.php#/policy/BJujesM\\_E?bc=true&bcCurrent=02%20-%20Policy%20on%20Academic%20Integrity&bcItem=policies](https://www.uvic.ca/calendar/archives/202101/grad/index.php#/policy/BJujesM_E?bc=true&bcCurrent=02%20-%20Policy%20on%20Academic%20Integrity&bcItem=policies)

### **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 Centre for Accessible Learning located in the Campus Services Building: <https://www.uvic.ca/services/cal/>. 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](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), Website: <https://uvicombudsperson.ca/>