

COURSE OUTLINE

ECE 456 – Wireless and Mobile Communications

Term –SUMMER 2020 (202005)

Instructor

Dr. Hong-Chuan Yang
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Office Hours

Days: Thursday
Time: 10:30–11:30am
Location: Virtual at URL

<https://uvic.zoom.us/j/98023785553?pwd=cTNtZjZHRXhiUi9sL0h0MnBRdUVadz09>

Course Objectives

To introduce various fundamental topics of current and future wireless communication systems, including propagation channel modelling, digital communication over fading channel, fading mitigation techniques, multiple access techniques, spread spectrum techniques, and selected advanced transmission technologies.

Learning Outcomes

- Analyze system capacity for given multiple access and duplexing schemes;
- Carry out cell coverage analysis using combined path loss and shadowing models;
- Categorize fading channels using the characteristics of transmitted signal and operation environment;
- Evaluate the performance of digital transmission over flat fading channels;
- Assess the performance benefits of fading mitigation techniques;
- Analyze the data rate of multicarrier transmission systems in selective fading environment.

Syllabus

- Introduction to wireless communications.
- Duplexing and multiple access techniques.
- Wireless channel models: path loss, shadowing, and multi-path fading.
- Digital modulation techniques and their performance over fading channels.
- Fading mitigation techniques: diversity techniques and multicarrier transmission.
- Selected advanced topics.

Lectures:

A- Section(s): A01 / CRN 30307
Days: Tuesday, Wednesday, Friday
Time: 9:30am-10:20am
Location: Virtual at URL <https://uvic.zoom.us/j/98601605450?pwd=Mm5uc3Q2dytCWTdmQVZnMjl4VTV3dz09>

Labs:

Location: ELW

Required Textbook

Title: Introduction to Digital Wireless Communications
Author: H.-C. Yang
Publisher: IET Press
Year: 2017

Online Course Delivery:

As this course will be conducted online during this term, students will need to attend lectures and complete assignments/exams and submit them online. The students will require access to a computer with stable Internet connection, preferably wired or through private WiFi. The students will also need scanning software/apps for electronic assignments/exams submission.

References:

- A. Goldsmith, Wireless Communications, Cambridge, 2005
- T. Rappaport, Wireless Communications, 2nd Ed, Prentice Hall, 2001
- R. Yates and D. Goodman, Probability and Stochastic processes, Wiley, 1999.
- J. Proakis, Digital Communications, 4th Ed, McGraw-Hill, 2000.

Assessment:

Assignments:	25 %	
Mid-terms:	75 %	Dates: June 5 (30%), July 10 (30%), and July 31 (15%).

Prerequisites:

ELEC 350 required, ELEC 450 (basics of digital communications and probability theory) recommended.

Course Homepage:

<http://coursespaces.uvic.ca/>: Log in with your University of Victoria Netlink ID and Password.

Assignments:

Eight to nine problems will be assigned. The assignments should be electronically submitted to the coursespaces before the due time. Selected problems from each assignment will be marked. Solution will be posted after the due dates. Late submission will not be accepted.

Important: All deadlines and schedules for this course will reference Pacific Daylight Time.**Note:**

Failure to pass two midterm exams 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 Undergraduate Calendar.

<https://www.uvic.ca/calendar2020-05/undergrad/index.php#/policy/S1AAgoGuV?bc=true&bcCurrent=14%20-%20Grading&bcltemType=policies>

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 Assistant to set up an appointment.

Course Withdrawal Deadlines:

- May 16, 2020: Withdrawal with 100% reduction of tuition fees
- June 6, 2020: Withdrawal with 50% reduction of tuition fees
- July 1, 2020: Last day for withdrawal (no fees returned)

Accommodation of Religious Observance:

<https://www.uvic.ca/calendar2020-05/undergrad/index.php#/policy/r1q0gofdN?bc=true&bcCurrent=10%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/calendar2020-05/undergrad/index.php#/policy/HkQ0pzdAN>

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>

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 Undergraduate Calendar for the UVic policy on academic integrity.

https://www.uvic.ca/calendar2020-05/undergrad/index.php#/policy/Sk_0xsM_V?bc=true&bcCurrent=08%20-%20Policy%20on%20Academic%20Integrity&bcltemType=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 an 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, 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. 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

Web: 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; Web: <https://uvicombudsperson.ca/>