ECE 456 – Wireless and Mobile Communications
Term – SUMMER 2019 (201905)

Instructor
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Office Hours
Days: Wednesday
Time: 11:30–12:20pm
Location: EOW 421

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: ECS 108

Required Text
Title: Introduction to Digital Wireless Communications
Author: H.-C. Yang
Publisher: IET Press
Year: 2017
References:
A. Goldsmith, Wireless Communications, Cambridge, 2005

Assessment:

<table>
<thead>
<tr>
<th>Assignments:</th>
<th>25%</th>
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<tbody>
<tr>
<td>Mid-terms:</td>
<td>75%</td>
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<td>Dates:</td>
<td>June 7, July 12, and August 2.</td>
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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 problem sets will be assigned. The assignments are due in the drop box in EOW on the due dates. Selected problems from each problem set will be marked. Solution will be posted after the due dates. Late submission will not be accepted.

Plagiarism detection software may be used to aid the instructor and/or TA's in the review and grading of some or all of the work you submit.

Exams:
There will be three midterm exams. The midterms are tentatively scheduled in class on June 7 (30%), July 12 (30%), and August 2 (15%). The midterms will be closed-book exams. One single-side formulae sheet and calculator is allowed.

Note:
Failure to pass two midterms 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://web.uvic.ca/calendar2019-05/undergrad/info/regulations/grading.html

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.

Accommodation of Religious Observance:
https://web.uvic.ca/calendar2019-05/undergrad/info/regulations/religious-observanc.html

Policy on Inclusivity and Diversity:
https://web.uvic.ca/calendar2019-05/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](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/calendar2019-05/undergrad/info/regulations/academic-integrity.html](https://web.uvic.ca/calendar2019-05/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 Centre for Accessible Learning 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.

**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
- **Web:** [www.uvic.ca/svp](http://www.uvic.ca/svp)