ELEC 516 – Advanced Wireless Communications

Term - FALL 2014 (201409)

Instructor
Dr. Hong-Chuan Yang
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E-mail: hy@uvic.ca

Office Hours
Days: Wednesdays
Time: 11:30am – 12:30pm or by appointment
Location: EOW 421

Lectures
A-Section(s): A01 / CRN 11247
Days: Tuesday, Wednesday, and Friday
Time: 1:30 ~ 2:20 pm
Location: ECS 108

B-Section(s): Days: Time(s):
N/A

Required Text
Title: Wireless Communications
Author: A. Goldsmith
Publisher: Cambridge
Year: 2005

Optional Text
Title: Order Statistics in Wireless Commun.
Author: H.-C. Yang and M.-S. Alouini
Publisher: Cambridge
Year: 2011

References:

Course Objective:
To investigate various advanced techniques for wireless communications, including statistical fading channel model, digital communications over fading channel, diversity for fading mitigation, adaptive transmissions, MIMO systems and space-time coding, and multicarrier modulation/OFDM.

Assessment:
Assignments: 30 %
Mid-term: 30 %
Project: 40 %
Date: TBD

Prerequisites:
ELEC 500 Random Signal and ELEC 456 Mobile Communications or equivalent.

Course Homepage:
http://coursespaces.uvic.ca/: Log in with your University of Victoria Netlink ID and Password.
The final grade obtained from the above marking scheme will be based on the following percentage-to-grade point conversion:

<table>
<thead>
<tr>
<th>Passing Grades</th>
<th>Grade Point Value</th>
<th>Percentage for Instructor Use Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td>9</td>
<td>90 – 100</td>
</tr>
<tr>
<td>A</td>
<td>8</td>
<td>85 – 89</td>
</tr>
<tr>
<td>A-</td>
<td>7</td>
<td>80 – 84</td>
</tr>
<tr>
<td>B+</td>
<td>6</td>
<td>77 – 79</td>
</tr>
<tr>
<td>B</td>
<td>5</td>
<td>73 – 76</td>
</tr>
<tr>
<td>B-</td>
<td>4</td>
<td>70 – 72</td>
</tr>
<tr>
<td>C+</td>
<td>3</td>
<td>65 – 69</td>
</tr>
<tr>
<td>C</td>
<td>2</td>
<td>60 – 64</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>50 – 59</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Failing Grades</th>
<th>Grade Point Value</th>
<th>Percentage for Instructor Use Only</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>0</td>
<td>0 – 49</td>
<td>Fail, *Conditional supplemental exam. (For undergraduate courses only)</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
<td>0 – 49</td>
<td>Fail, no supplemental.</td>
</tr>
<tr>
<td>N</td>
<td>0</td>
<td>0 – 49</td>
<td>Did not write examination, Lab or otherwise complete course requirements by the end of term or session; no supplemental exam.</td>
</tr>
</tbody>
</table>

*Assignment of E grade will be at the discretion of the Course Instructor.*

The rules for supplemental examinations are found on page 80 of the current 2014/15 Undergraduate Calendar.

<table>
<thead>
<tr>
<th>Term in which E Grade Was Obtained</th>
<th>Application Deadline for Supplemental Exam</th>
<th>Supplemental Exam Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>First term of Winter Session (Sept – Dec)</td>
<td>February 28 in the following term</td>
<td>First week of following May</td>
</tr>
<tr>
<td>Second term of Winter Session (Jan – Apr)</td>
<td>June 30 in the following term</td>
<td>First week of following September</td>
</tr>
<tr>
<td>Summer Session (May – Aug)</td>
<td>October 31 in the following term</td>
<td>First week of following January</td>
</tr>
</tbody>
</table>

Deferred exams will normally be written at the start of the student's next academic term; i.e., approximately 4 months following the deferral of the exam.
Assignments:  
There will be five to six problem sets. Some problems may require use of mathematical software (such as Matlab, Mathematica and Maple) for calculation and/or plots. The homework will be due before lectures on the due dates.

Exams:  
There will be one midterm exam in the second half of the term. The exam counts 30% to the final grade.

Projects:  
The project will be a research project on various emerging wireless communication techniques. Students are supposed to study one of the suggested papers and related references for the project. The project will be evaluated based on in-class presentation and final written report. During the presentation, to be held in the middle of the term, students should discuss the background and motivation of the project, including literature review (10%). The final report should be a comprehensive summary of students’ investigation and is due by email on Dec. 16, 2014 (25 pages maximum, 30%).

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 ECE Chair by email or the ECE Chair’s Secretary ecceasst@uvic.ca to set up an appointment.*

Accommodation of Religious Observance  
See [http://web.uvic.ca/calendar2014/GI/GUPo.html](http://web.uvic.ca/calendar2014/GI/GUPo.html)

Policy on Inclusivity and Diversity  
See [http://web.uvic.ca/calendar2014/GI/GUPo.html](http://web.uvic.ca/calendar2014/GI/GUPo.html)

Standards of Professional Behaviour  
You are advised to read the Faculty of Engineering document Standards for Professional Behaviour at [http://www.uvic.ca/engineering/current/undergrad/index.php#section0-25](http://www.uvic.ca/engineering/current/undergrad/index.php#section0-25) which contains important information regarding conduct in courses, labs, and in the general use of facilities.

Cheating, plagiarism and other forms of academic fraud are taken very seriously by both the University and the Department. You should consult [http://web.uvic.ca/calendar2014/FACS/Unln/UARE/PoAcI.html](http://web.uvic.ca/calendar2014/FACS/Unln/UARE/PoAcI.html) for the UVic policy on academic integrity.