UVic Department of Electrical and Computer Engineering

COURSE OUTLINE
ELEC 450 – Communication Theory and Systems II
Summer 2014

Instructor:

Dr. Xiaodai Dong
Phone: 250-721-6029
E-mail: xdong@ece.uvic.ca

Office Hours:

Days: Thursdays or by appointment
Time: 1pm-3pm
Location: EOW-439

Lectures:

A-Section(s): A01,A02 / CRN 30307(8)
Days: Mondays and Thursdays
Time: 10am-11:20am
Location: ECS-130

Labs: **Location: ELW**

B-Section(s)	Days	Time
B01	Tuesdays	2:30-5:30pm
Start from the week of May 26, one lab every two weeks		
B04	Thursdays	4:00-7:00pm
Start from the week of June 2, one lab every two weeks		

Required Text:

Title: Digital Communications Fundamentals and Applications
Author: B. Sklar
Publisher: Prentice Hall
Year: 2nd edition, 2001

Assessment:

Assignments:	10%	
Labs	15%	
Mid-term	30%	Date: June 26, 2014
Final	45%	

Note: Failure to complete all laboratory requirements will result in a grade of N being awarded for the course.

Due dates for assignments:

There will be five assignments, each of which must be submitted in class on the due date. Due dates must be respected. Late hand-ins will be penalized.

The final grade obtained from the above marking scheme will be based on the following percentage-to-grade point conversion:

Passing Grades	Grade Point Value	Percentage for Instructor Use Only	
A+ A A-	9 8 7	90 – 100 85 – 89 80 – 84	
B+ B B-	6 5 4	77 – 79 73 – 76 70 – 72	
C+ C	3 2	65 – 69 60 – 64	
D	1	50 – 59	
Failing Grades	**Grade Point Value**	**Percentage for Instructor Use Only**	**Description**
E	0	35 - 49	Fail, conditional supplemental exam. (For undergraduate courses only)
F	0	0 – 49	Fail, no supplemental.
N	0	0 – 49	Did not write examination, Lab or otherwise complete course requirements by the end of term or session; no supplemental exam.

The rules for supplemental examinations are found on page 80 of the current 2013/14 Undergraduate Calendar.

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

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.

Course Description

1. Course Objectives

   The objectives of the course are to introduce the fundamental theories of digital communications and the components of digital communication systems. This course lays the foundation for communications specialization.

2. Learning Outcomes

   a) Understand the basic concepts of energy signals and power signals, autocorrelation function, power spectral density of random signals

   b) Convert an analog source to digital signals by sampling and quantization, analyze quantization error, and compare uniform and non-uniform quantization

c) Understand pulse coded modulation and other baseband transmission schemes, understand the different properties of these modulation schemes

d) Grasp the basic idea of signal space and the concepts of signal distance, orthogonality, energy, and perform Gram-Schmidt orthogonalization on a set of signals

e) Know how to characterize the additive white Gaussion noise channel

f) Have full knowledge of basic digital modulation schemes such as ASK, PSK, QAM and FSK

g) Understand the whole transmitter chain including pulse shaping

h) Design optimum receivers based on matched filtering and optimum decision rules

i) Analyze the performance of various digital modulation schemes

j) Know the operating principle of differential encoding/detection and non-coherent receivers

k) Design pulse shapes to avoid intersymbol interference in a bandlimited channel

l) Have basic idea of channel equalizer

3. Syllabus

a) Introduction, signals and spectra review, probability review
b) Formatting and baseband transmission
c) Bandpass modulation and signal space
d) Optimum receivers in additive white Gaussian noise channels
e) Differential encoding/detection and non-coherent receivers
f) Channel equalization

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 to set up an appointment.

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

Policy on Inclusivity and Diversity
See 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 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/UnIn/UARe/PoAcI.html for the UVic policy on academic integrity.

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.