UVic Department of Electrical and Computer Engineering

COURSE OUTLINE

ELEC 310 – Digital Signal Processing I

Spring 2014

Instructor:

Dr. Michael McGuire
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Office Hours:

Days: Wednesday
Time: 13:00-15:00
Location: EOW 431

Lectures:

A-Section(s): A01 & A02 / CRN 21063 & 21064
Days: TWF
Time: 10:30-11:20
Location: BWC A104

Required Text:

Title: Discrete Time Signal Processing (3rd Ed)
Author: A.V. Oppenheim, R.W. Schafer
Publisher: Prentice-Hall
Year: 2010

References:

Assessment:

Assignments:	20 %	
Labs	%	
Mid-term	40 %	Date: January 31, February 28
Final	40 %	

Due dates for assignments: TBD

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

To obtain a basic familiarity with the concept of processing continuous time signals via digital sampling and reconstruction. To develop an understanding the ambiguity inherent with sampled signals and how to resolve this ambiguity.

2. Learning Outcomes
   a) Categorize digital systems based on their properties (such as linearity, time invariance, causality, memory, invertibility, and BIBO stability)
   b) Identify basic properties of convolution and compute the convolution of discrete signals.
   c) Explain the significance of convolution in the context of discrete LTI systems

d) State the basic properties of the Fourier and Z transforms and use these properties in problem solving.

e) Evaluate forward/inverse Fourier and Z transforms of discrete signals

f) Demonstrate competency in working with both time- and frequency-domain representations of discrete signals and systems

g) Design a discrete time filtering algorithm based on given requirements

h) Use Matlab effectively for the analysis of digital signals and for the design of basic digital systems

i) Explain the significance of the sampling theorem and use it in the context of discrete processing of continuous time signals

3. Syllabus

Generation of discrete-time signals through the sampling process and their spectral representation. Mathematical representation and properties of digital signal processing (DSP) systems. Typical DSP systems, e.g., digital filters, and applications. The z transform and its relation to the Laurent series. Evaluation of the inverse z transform using complex series and contour integrals. Application of the z transform for representation and analysis of DSP systems. The processing of continuous time signals using DSP systems. The discrete-Fourier transform and the use of fast Fourier transforms for its evaluation. Introduction to the design of DSP systems.

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/calendar2013/GI/GUPo.html

Policy on Inclusivity and Diversity

See http://web.uvic.ca/calendar2013/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/calendar2013/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.