Faculty of Engineering

COURSE OUTLINE

ELEC 310 – Digital Signal Processing: I

Term – SUMMER 2015 (201505)

Instructor

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Office Hours

Days: Wednesday
Time: 1:30 – 2:30pm or by appointment
Location: EOW 421

Lectures:

A- Section(s): A01 / CRN 30311, A02 / CRN 30312
Days: Tuesday, Wednesday, Friday
Time: 11:30am-12:20pm
Location: Clearihue A212

Labs: **Location: ELW**

B01 Tue 14:30-17:20 TA (email)

Required Text

Title: Discrete-Time Signal Processing
Author: Oppenheim and Schafer
Publisher: Prentice Hall
Year: 2010

Optional Text

Title:
Author:
Publisher:
Year:

References:

A. V. Oppenheim and A. S. Willsky, Signal & Systems, 2nd, Prentice Hall, 1997.
S. K. Mitra, Digital Signal Processing, 3rd, McGraw Hill, 2006.
R. J. Schilling and S. L. Harris, Fundamentals of Digital Signal Processing using Matlab, Thomson, 2005

Assessment:

Assignments:	25 %	
Mid-terms:	75 %	Dates: June 2, July 7, and July 31.

Prerequisites:

ELEC 255 System Dynamics or ELEC 260 Signal Analysis.

Course Homepage:

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

Course Objectives

Generation of discrete-time signals through the sampling process and their spectral representation. Mathmatical 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.

Learning Outcomes

- Understand the sampling and reconstruction process of continuous-time signal;
- Represent discrete-time signals in frequency and z domains;
- Mathematically characterize DSP systems;
- Understand the advantages and limitations of discrete processing of continuous-time signals;
- Master basic DSP system design tools.

Syllabus

- Discrete-time signal and systems (chp. 2)
- Z-transform and its application to system analysis (chp. 3)
- Sampling theorem (chp. 4)
- Transform analysis of discrete-time system (chp. 5)
- Discrete Fourier transform and its calculation (chp. 8, 9)
- Basic DSP system design. (chp. 6, 7)

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 assignment 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 midterm is tentatively scheduled in class on June 2, July 7, and July 31. The midterms will be close-book exams. One single-side formulae sheet and calculator is allowed. Tutorial sessions will be scheduled before the midterms.

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.

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 Secretary to set up an appointment.

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

Policy on Inclusivity and Diversity
http://web.uvic.ca/calendar/GI/GUPo.html

Standards of Professional Behaviour

You are advised to read the Faculty of Engineering document Standards for Professional Behaviour in current Undergraduate Calendar, 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 entry in current Undergraduate Calendar for the UVic policy on academic integrity.

http://www.uvic.ca/engineering/assets/docs/professional-behaviour.pdf

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.