University
of Victoria

**Electrical &
Computer
Engineering**

ELEC 310 – Digital Signal Processing 1

Jan-Apr 2018 (A01: 21134, A02: 21135)

Instructor
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Office Hours
Everyday email or phone first
Location: EOW 433

Course Objectives

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.

Learning Outcomes

1. Understand linearity, time invariance and convolution

2. Explain relation between continuous- and discrete-time Fourier transform

3. Understand z-transform and its use in solving problems

4. Evaluate forward and inverse z and Fourier transforms for discrete signals

5. Demonstrate competency in working with both time- and frequency-domain representations of discrete-time sampled signals

6. Design a discrete-time filtering algorithm based on given requirements

7. Use MATLAB effectively for analysis and design of sampled digital signals

8. Explain significance of sampling theorem and use it in the context of discrete-time processing of continuous-time signals

Syllabus

Chapter 1   Introduction
Chapter 2   Sinusoids
Chapter 3   Spectrum representation
Chapter 4   Sampling and aliasing
Chapter 5   FIR filters
Chapter 6   Frequency response of FIR filters
Chapter 7   Discrete-time Fourier transform
Chapter 8   The discrete Fourier transform
Chapter 9 z-Transform

Lectures
Days: Tue, Fri
Time: 3:30 – 4:50
Location: HHB 105

Required Text

Textbook: DSP First A Multimedia Approach, 2nd edition, J.H. McClellan, R.W. Schafer and M.A. Yoder, Prentice Hall, 2017

Assessment

Activity	Grade
Assignments	0 %
Two quizzes (10% each)	20%
Mid term	30%
Final	50%
Total	100 %

Tentative Midterm dates are to be found at:

http://www.ece.uvic.ca/~fayez/courses/elec310/schedule.html

<u>**Note:**</u>

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/calendar2018-01/undergrad/info/regulations/grading.html

There will be no supplemental examination for this course.

Note to Students

- Conduct of course: 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.

- 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 Resource Centre for Students with a Disability 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.

Accommodation of Religious Observance

`https://web.uvic.ca/calendar2018-01/undergrad/info/regulations/religious-observanc.htm`

Policy on Inclusivity and Diversity

`https://web.uvic.ca/calendar2018-01/general/policies.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.

`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/calendar2018-01/undergrad/info/regulations/academic-integrity.html`

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.