

ECE 310 -Digital Signal Processing I

Term – Summer 2019 (201905)

Instructor

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Office Hours

Days: Wednesdays
Time: 3-4PM
Location: EOW 451

Course Objectives

- Understand the basics of discrete time signal processing.
- Present the basic mathematics for sampling including which signals can be uniquely represented with samples and the source of the ambiguity.
- Describe linear time invariant systems and how these systems can be used to process signals for engineering applications.
- Introduce the mathematical transform techniques used to simplify signal processing calculations. Show how these transforms can be used for designing signal processing systems.
- Extend the time/frequency relationships for continuous time signals to sampled/discrete-time signals.

Learning Outcomes

- Understand linearity, time invariance and convolution
- Explain the relations between the continuous- and discrete-time Fourier transform
- Understand the Z-transform and its use in solving problems.
- Evaluate forward and inverse Z and Fourier transforms for discrete signals
- Demonstrate competency in working with both time- and frequency-domain representations of discrete-time sampled signals
- Design a discrete-time filtering algorithm based on given requirements.
- Use MATLAB effectively for analysis and design of sampled digital signals
- Explain significance of the sampling theorem and use it in the context of discrete-time processing of continuous-time signals

Syllabus

1. A Introduction to Signals and Sampling
2. A Review of Sinusoidal Signals
3. Sampling and Aliasing
4. Discrete-Time Systems
5. The Discrete-Time Fourier Transform
6. The Discrete Fourier Transform
7. The Z-transform
8. Digital Filters
9. Implementation of Digital Filters

A-Section(s): A01 / CRN 30282
Days: Mondays and Thursdays
Time: 10:00 – 11:20 AM
Location: CLE A127

Tutorial: T01
Wednesday, Weeks before midterms and final
1:30-2:20 PM
COR A221

Required Text

Title: Introduction to Digital Signal Processing
 Author: Fayez Gebali
 Publisher: University of Victoria
 Year: 2019

Optional Text

Title: DSP First, Second Edition
 Author: J.H. McClellan, R.W. Schafer, M.A. Yoder
 Publisher: Pearson Education, Inc.
 Year: 2016

Assessment:

Assignments:	20 %	Due Dates: TBD
Mid-terms	40 %	Dates: June 6, July 4
Final Exam	40 %	

Note: Failure to pass the final exam will result in a failing grade for the course.

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/calendar2019-05/undergrad/info/regulations/grading.html>

Assignment of E grade and supplemental examination for this course will be at the discretion of the Course Instructor. The rules for supplemental examinations can be found in the current Undergraduate Calendar.

<https://web.uvic.ca/calendar2019-05/undergrad/info/regulations/exams.html#>

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 Assistant to set up an appointment.

Accommodation of Religious Observance:

<https://web.uvic.ca/calendar2019-05/undergrad/info/regulations/religious-observanc.html>

Policy on Inclusivity and Diversity:

<https://web.uvic.ca/calendar2019-05/general/policies.html>

Standards of Professional Behaviour: You are advised to read the Faculty of Engineering document Standards for Professional Behaviour, 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/calendar2019-05/undergrad/info/regulations/academic-integrity.html>

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 Centre for Accessible Learning 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.

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.

Sexualized Violence Prevention and Response at UVic

UVic takes sexualized violence seriously, and has raised the bar for what is considered acceptable behaviour. We encourage students to learn more about how the university defines sexualized violence and its overall approach by visiting www.uvic.ca/svp. If you or someone you know has been impacted by sexualized violence and needs information, advice, and/or support please contact the sexualized violence resource office in Equity and Human Rights (EQHR). Whether or not you have been directly impacted, if you want to take part in the important prevention work taking place on campus, you can also reach out:

Where: Sexualized violence resource office in EQHR; Sedgewick C119

Phone: 250.721.8021

Email: svpcoordinator@uvic.ca

Web: www.uvic.ca/svp