

COURSE OUTLINE

ECE 310 – Digital Signal Processing 1 Second (Spring) Term 2021 (202101)

Instructor

Dr. F. Gebali, PhD, PEng
Phone: 250-721-6509
E-mail: fayez@uvic.ca

Office Hours

Day: Monday
Time: 10:30-11:20
Platform: Zoom
<https://uvic.zoom.us/j/91962702236>
passcode: 456851

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. Explain significance of the sampling theorem and use it in the context of discrete-time processing of continuous-time signals
2. Understand linearity, time invariance and convolution for discrete time systems and signals.
3. Be able compute the time-domain and frequency-domain responses of discrete-time filters.
4. Analyze discrete-time systems/signals using Continuous-time Fourier, Discrete-Time Fourier, and z -transforms

Syllabus

| | |
|------------|---------------------------------|
| Chapter 1 | Signals |
| Chapter 2 | Sinusoidal Signals |
| Chapter 3 | Sampling and Aliasing |
| Chapter 4 | Discrete-Time Systems |
| Chapter 5 | Discrete-Time Fourier transform |
| Chapter 6 | Discrete Fourier transform |
| Chapter 7 | z -Transform |
| Chapter 8 | Digital Filters |
| Chapter 10 | Discrete-Time Systems |

Lectures

Days: Tue, Wed, Fri
Time: 10:30 – 11:20
Platform/Link

<https://uvic.zoom.us/j/91962702236>
passcode: 456851

Required Textbook¹

Title: Digital Signal Processing
Author: F. Gebali
Publisher: UVic Press
Year: 2021

Optional Textbooks

Title: Digital Signal Processing
Author: F. Gebali
Publisher: UVic Press
Year: Earlier editions

Online Course Delivery

As this course will be conducted online during this term, students will need to complete assignments online. The students will require access to a computer which has the following software installed: Zoom <https://zoom.us/download>.

Assessment

| Activity | Grade | Date |
|------------------------|--------------|-----------------------------|
| Assignments | 0 % | |
| Two Quizzes (10% each) | 20% | Feb 5 & Apr 7, respectively |
| Mid term | 30% | Mar 5 |
| Final | 50% | |
| Total | 100 % | |

Important: All deadlines and schedules for this course will reference Pacific Standard Time until March 14, 2021 and then Pacific Daylight Time.

Note:

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://www.uvic.ca/calendar/archives/202101/undergrad/index.php#/policy/S1AAgoGuV?bc=true&bcCurrent=14%20-%20Grading&bcGroup=Undergraduate%20Academic%20Regulations&bcItemType=policies>

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 Assistant to set up an appointment.

Course Withdrawal Deadlines:

1. January 19, 2021: Withdrawal with 100% reduction of tuition fees (under review)
2. February 9, 2021: Withdrawal with 50% reduction of tuition fees (under review)
3. February 28, 2021: Last day for withdrawal (no fees returned) (under review)

Accommodation of Religious Observance:

<https://www.uvic.ca/calendar/archives/202101/undergrad/index.php#/policy/r1q0gofdN?bc=true&bcCurrent=10%20-%20Accommodation%20of%20Religious%20Observance&bcItemType=policies>

Policy on Inclusivity and Diversity:

Engineering: <https://www.uvic.ca/engineering/about/equity/index.php> Academic Calendar: <https://www.uvic.ca/calendar/archives/202101/undergrad/index.php#/policy/HkQ0pzdAN?bc=true&bcCurrent=%20General%20University%20Policies&bcGroup=General%20University%20Policies&bcItemType=policies>

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>

Academic Integrity

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://www.uvic.ca/calendar/archives/202101/undergrad/index.php#/policy/Sk_0xsM_V?bc=true&bcCurrent=08%20-%20Policy%20on%20Academic%20Integrity&bcItemType=policies

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 an appropriate accommodation. Alternatively, you may want to contact the Centre for Accessible Learning located in the Campus Services Building. <https://www.uvic.ca/services/cal/>. The University of Victoria is committed to promoting, providing, and protecting a positive, 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

Office of the Ombudsperson:

The Office of the Ombudsperson is an independent and impartial resource to assist with the fair resolution of student issues. A confidential consultation can help you understand your rights and responsibilities. The Ombudsperson can also clarify information, help navigate procedures, assist with problem-solving, facilitate communication, provide feedback on an appeal, investigate and make recommendations. Phone: 250-721-8357; Email: ombuddy@uvic.ca, Website: <https://uvicombudsperson.ca/>