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University of Waterloo
Department of Electrical and Computer Engineering

ECE 207 - Signals and Systems
Fall 2021
Course Outline

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Instructor:

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Teaching Assistants:

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Schedule:

Lectures will be delivered online. Several recorded videos will be released roughly every week on the course website on UW-Learn. Students are expected to go through these videos on regular basis every week to make themselves familiar with the course material. Tutorials will be delivered in-person. Recordings of the tutorials will be posted on UW-Learn.

Resources:

1. Textbook: "Linear Systems and Signals" 3rd edition by B. P. Lathi and R. Green, Oxford University Press, 2018.
2. Lecture notes and tutorial notes will be posted on UW-Learn.
3. Website (UW-LEARN): **https://learn.uwaterloo.ca**
4. Discussion board on Piazza is used for clarification of assignment problems and course content. Students are not allowed to post solutions of problems on Piazza or any other website.
5. Graded assignment problems are assigned roughly every week from the textbook. Assignment problems help you learn the course material and prepare you for the exams. Students are expected to solve the problems individually on their own. Copying problem solutions from any individual or any other resource is not allowed. The required assignment problems are posted on the course website. Students are expected to submit the assignments on UW-Learn. Assignment solutions will be posted on the course website after the submission is completed.

Grading:

- Assignment problems (10%), Midterm (28%), Final#1 (30%), Final#2 (32%).

Course Description:

Continuous, discrete, and periodic signals, time-domain and frequency-domain analysis of continuous-time and discrete-time linear systems, periodic signals and Fourier series, non-periodic signals and Fourier transforms.

Course Content:

Topic	Textbook Sections
1. Introduction to Signals and Systems: Continuous-time (CT) and discrete-time (DT) signals, properties of signals and systems, system models.	B.1*-B.4*, B.8*, 1.1-1.10, 3.1-3.3
2. Time-Domain Analysis of Continuous-Time Systems: Zero-input response, impulse response, zero-state response, convolution, stability, system behavior.	2.1-2.5, 2.6*, 2.8*
3. Time-Domain Analysis of Discrete-Time Systems: System models, zero-input response, impulse response, zero-state response, stability, system behavior.	3.4-3.9, 3.10*, 3.12*
4. Frequency-Domain Analysis of Continuous-Time Systems: Laplace transform (LT) and its properties, system response using LT, stability, electrical transformed networks, block diagrams, system realization, application to control systems, frequency response.	4.1-4.8, B.5*
5. Frequency-Domain Analysis of Discrete-Time Systems: Z-transform (ZT) and its properties, system response using ZT, stability, system realization, frequency response.	5.1-5.5
6. Continuous-Time Periodic Signals Analysis – The Fourier Series: Fourier series and its properties, Parseval's theorem, system response to periodic inputs.	6.1-6.4
7. Continuous-Time Non-Periodic Signals Analysis – The Fourier Transform: The Fourier transform (FT) and its properties, system response using FT, ideal and practical filters, Parseval's theorem, application to communication systems.	7.1-7.6, 7.7-1*, 7.7-2*

* Required reading material. Few additional materials will be presented in lectures.

Student Responsibilities:

Students are expected to know what constitutes an academic integrity, to avoid committing academic offences, and to take responsibility for their actions. Cheating and/or plagiarism will not be tolerated, especially for online submission of assignments and online exams. For information on categories of offences and penalties, students should refer to UW Policy #71 at **http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm** (Student Academic Discipline).

Students are also responsible for all announcements made in lectures or on the course website.

Additional Notes:

- Students with disabilities are referred to register with the **AccessAbility Office**.
- Expected exams schedule: Midterm Oct 26, Final#1 Nov 23, and Final#2 will be scheduled during final exams period.
- The instructor reserves the right to make changes to this course outline as needed.