Lahore University of Management Sciences

EE 310 – Signals and Systems

Spring 2025

Instructor	Zubair Khalid
Room No.	9-251 (Zubair)
Office Hours	Tuesday and Thursday 1:00 pm – 2:00 pm
Email	zubair.khalid@lums.edu.pk
Telephone	042 3560 8477 (Zubair)
Secretary/TA	
TA Office Hours	TBA
Course URL (if any)	https://lms.lums.edu.pk/

Course Basics				
Credit Hours	3			
Lecture(s)	Nbr of Lec(s) Per Week	2	Duration	75 minutes
Recitation/Lab (per week)	Nbr of Lec(s) Per Week		Duration	

Course Distribution	
Core	Core Course for EE Majors
Elective	May be Elective for others
Open for Student Category	Anyone with the required pre-requisite
Close for Student Category	Anyone not fulfilling the required pre-requisite

COURSE DESCRIPTION

Signals and Systems introduces the mathematical and conceptual foundations used to model, analyze, and design engineering systems that process information. The course develops a unified framework for continuous-time and discrete-time signals, emphasizing system properties, linear time-invariant (LTI) systems, convolution, and frequency-domain analysis. Students learn Fourier series and Fourier transforms for spectral interpretation and filtering, along with Laplace and z-transforms for system characterization and solving differential/difference equations. Modern computational labs (Python/Jupyter and/or MATLAB) reinforce core concepts through simulation and real-world signals such as audio and sensor data, building intuition alongside rigorous analysis.

COURSE PREREQUISITE(S)

- Enforced: Calculus I (MATH 101)

Grading Breakup and Policy (Tentative)

Project and Homework(s)/Assignment(s): 20%
Quizzes: 15%
Midterm Examination:30%
Final Examination:30%

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Course Learning Outcomes	
	By the end of the course, the students should
CLO1	describe basic mathematical concepts as they apply to signals and systems analysis
CLO2	mathematically describe and analyze signals and linear time-invariant systems in the time domain
CLO3	mathematically describe and analyze signals and linear time-invariant systems in the transform domain

Relation to EE Program Outcomes

EE-310 CLOs	Related PLOs	Level of Learning	Teaching Methods	CLO Attainment checked in
CLO1	PLO1	Cog-3	Instruction, Homework	Midterm, Final
CLO2	PLO1	Cog-4	Instruction, Homework	Midterm, Final
CLO3	PLO2	Cog-4	Instruction, Homework	Midterm, Final

Examination Detail (Tentative)	
Midterm Exam	Yes/No: Yes Combine Separate: Combined Duration: 3 hours Preferred Date: During the Midweek Exam Specifications: Closed book closed notes/Calculators Allowed/
Final Exam	Yes/No: Yes Combine Separate: Combined Duration: 3 hours Date: December 19 (11:30-14:30) Exam Specifications: Closed book, closed notes/Calculators Allowed/ Formula sheet would be provided

Textbook(s)/Supplementary Readings

Text 1: Signals and Systems by Simon Hykin & Linear Systems and Signals by B. P. Lathi
Text 2: Signals and Systems by Alan V. Oppenheim, Alan S. Willsky with S. Hamid Nawab

Lectures	Topics	Related CLOs
1-4	Introduction to signals and system	CLO 1,2
5-8	Linear time invariant systems	CLO 1,2
9-12	Fourier Series	CLO 1,2,3
13-16	Continuous-time Fourier transform	CLO 1,3
17-19	Discrete-time Fourier transform	CLO 1,3
20	Sampling	CLO 1,2,3
21-22	Time and Frequency Characterization of first and second order systems	CLO 1,2,3
23-25	Laplace Transform	CLO 1,3
26-27	Z- transform	CLO 1,3