EE 3302-501, Course Syllabus: Signals and Systems SPRING 2023

Course Information:

Class Number:	25417
Course Number:	3302,
Class Section:	EE3302-501 (SPRING 2023)
Course Name:	Signals and Systems, Lecture Course, Jan. 17, 2023 – May 5, 2023
Term:	2023 SPRING
Class Schedule:	Tuesday & Thursday, 5:30 pm - 6:45 pm, (Lecture Sessions)
Class Location:	ECSN 2.112
Lecture Sessions:	As per UTD Policy, Lecture sessions require In-Person attendance by all enrolled students.
	Also, depending on the UTD policy at the time, lecture sessions MAY OR MAY NOT BE
	Recorded Online using Microsoft Teams Meeting and may/may not be available at
	eLearning.utdallas.edu.

NOTE 1: The UTD, ECS, and ECE Dept and COVID policies in Spring 2023 will be followed.

Instructor and contact Information:

Name:Professor Issa Panahi, PhD ECEOffice Phone:972-883-2784Email: issa.panahi@utdallas.eduOffice Location:ECSN 4.214Office Hours:Communication by appointment only and via email only or online using MS-Teams meeting.

NOTE 2: Correspondence with instructor and TA will also be via UTD emails of students.

NOTE 3: The UTD, ECS, and ECE Dept and COVID policies in Spring 2023 will be followed.

The Course Teaching Assistant (TA): Once assigned, the TA's name and email will be announced.

Course Enrollment Requirements:

Pre-requisites: ENGR 3300.

Credit cannot be received for more than one of the following: BMEN 3302 or BMEN 3402 or CE 3303.

Class Attributes: No Course Auditing is Allowed.

Course Description:

This course presents some basic concepts and applications of signals and systems. The course topics cover continuous-time and discrete-time signals and systems in both the time-domain and the Fourier/Frequency-domain. Learning the course materials requires good knowledge in mathematics (calculus) and engineering math.

Student Learning Objectives/Outcomes:

By the end of this course students are expected to be able to:

• Know several types of continuous-time and discrete-time signals, periodic and energy signals

- Evaluate power and energy of signals
- Use linear convolution for continuous-time and discrete-time signals and linear-time invariant systems
- Evaluate the Fourier Series and its properties, for periodic signals
- Evaluate the Fourier Transform and its properties, for energy signals
- Convert a continuous-time signal to discrete-time signal and convert sampled signals to continuous-time signal based on the sampling theorem fundamentals.
- Learn the concept of Z-Transform, its properties and applications.

Course Resources - Materials, and Textbooks:

- 1. <u>Course Lecture notes:</u> Will be provided to the enrolled students.
- 2. Course Textbooks: Either one of the following textbooks can be used for study and homeworks.
- "Signals & Systems". 2nd Edition. By Alan V. **Oppenheim**, Alan S. Willsky, S. H. Nawab. Prentice Hall, ISBN 0-13-814757-4
- "Continuous and Discrete Signals and Systems". 2nd Edition. By Samir S. Soliman, Mandyam D. Srinath. Prentice Hall, ISBN 0-13-518473-8

Optional references for extra reading / exercise:

- "Signals and Systems". 2nd Edition. By Hwei Hsu.
 - and, Schaum's Outlines. McGraw Hill, 2011, ISBN 978-0-07-163472-4

Assignments & Academic Calendar:

Homework: Homework assignments will be given regularly. You may work and learn in groups in doing the homework problems. You need to submit each set of your completed assignments individually by the due date and on time to the course TA using ONLY your own UTD email address. No late submission.

<u>NOTE 4</u>: Doing the homework assignments is OPTIONAL, but it is essential to the learning process and is highly encouraged. The homework assignments WILL NOT BE GRADED. However, the solutions will be provided after the due dates.

Exams: There will be two exams plus the final exam. Exams WILL BE given in the class and attendance of every enrolled student is required in person. The dates for two exams will be announced in advance. The date of final exam is set and announced by UTD.

- There will be no late exam or makeup exam for anyone.
- Students requiring special assistance MUST contact the UTD Student Assistance Office and follow the UTD procedures and policies on time well in advance of the exam dates.

Course Layout:

• The Class/Lecture Notes follow the organization of Textbook by Samir S. Soliman, Mandyam D. Srinath.

The selected topics and course materials will be presented according to the **Class/Lecture Notes** in the following order:

- (1) Study of Continuous-time signals and systems in time-domain and in frequency-domain,
 - Lecture Notes: Ch 1 through Ch 4.
- (2) Sampling Theorem,
 - Lecture Notes: Ch 4
- (3) Study of Discrete-time signals and systems; in time-domain and in frequency-domain,

• Lecture Notes: Ch 6 and Ch 7.

(4) Z-Transform, (if Time permits)

• Lecture Notes: Ch 8, and/or sections of it.

NOTE 5: Although in different order, the topics of lecture notes are the same as those in the listed Textbooks.

Topics of lecture notes are similar to selected topics in sections of the Oppenheim Textbook from chapters 1, 2, 3, 4, 5, 7, 9, and 10. They are also the same as those sections in the textbook by Soliman.

Course Schedule:

NOTE 6: Class lecture notes follows the organization of the textbook by **Soliman**.

- Time-domain analysis of Continuous-time and Discrete-time periodic and energy (non-periodic) signals, linear systems, and input-output relationship of linear systems, Signals and Systems classifications, Convolution, Linear Time-Invariant (LTI) systems, System input-output descriptions.
 (from Class/Lecture Notes, Selected topics of Chapters 1, 2 of Oppenheim book)
 - **Exam 1.** Date and duration will be announced by instructor in advance.
- Frequency-domain analysis of Continuous-time and Discrete-time periodic and energy signals, linear systems, and input-output relationship of LTI systems.
 (from <u>Class/Lecture Notes</u>, Selected topics of Chapters 3, 4, 5 of Oppenheim book)
 - Exam 2. Date and duration will be announced by Instructor in advance.
- Sampling Theorem, an introduction. (from <u>Class/Lecture Notes</u>, Selected topics of Chapter 7 of Oppenheim book)
- 4. Z-Transform, if time permits.

(from <u>Class/Lecture Notes</u>, Selected topics of Chapter 10 of Oppenheim book)

• **Final Exam.** Date and time will be set and announced by UTD. Final Exam covers all the topics and materials discussed in the class and lecture sessions.

Grading Policy:

The evaluation of the student's work is the instructor's professional judgment and not subject to negotiation. Final course score will be determined by Exam 1 (Midterm Exam) (30%), Exam 2 (30%), and Final Exam (40%). Final course grades will be based on the course total numerical score.

Course Assignments & Instructor Policies:

- ✓ Every student enrolled in the course must take the exams in-person in classroom.
- ✓ No late or makeup exams will be allowed.
- ✓ Submission of homework assignments are optional. Submissions, if any, are due by the set deadlines. They should be submitted to the course TA via student's UTD email addresses. No late submission.
- ✓ Students must ONLY use their UTD email addresses for any correspondence & communication.
- ✓ Any communication and/or meeting with instructor and with TA must be set by appointment.
- ✓ The UTD, ECS, and ECE Dept and COVID safety policies in 2022-2023 will be followed.
- ✓ Any change of policies, course topics & materials and exams are all at the discretion of the instructor.
- ✓ Auditing the course by any non-registered/non-enrolled student is prohibited by the UTD/school policy.
- ✓ The instructor may or may not record meetings and lecture sessions of this course. Any recordings will be

available to all students registered for this class as they are intended to supplement the classroom experience.

COVID-19 Guidelines, and UTD Resources:

The information contained in the following link lists the University's COVID-19 resources for students and instructors of record. **Please see <u>http://go.utdallas.edu/syllabus-policies</u>.**

The instructor may or may not record meetings and lecture sessions of this course. Any recordings will be available to all students registered for this class as they are intended to supplement the classroom experience. Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student AccessAbility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not enrolled in the class/course, or uploaded to other online environments except to implement an approved Office of Student AccessAbility accommodation. If the instructor or a UTD school/department/office plans any other uses for the recordings, consent of the students identifiable in the recordings is required prior to such use unless an exception is allowed by law. Failure to comply with these University requirements is a violation of the Student Code of Conduct.

Comet Creed:

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same: (Stay updated on all Comet and UTD policies)

"As a Comet, I pledge honesty, integrity, and service in all that I do."

UT Dallas Syllabus Policies and Procedures:

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus.

Please go to <u>http://go.utdallas.edu/syllabus-policies</u> for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.

Jan. 5, 2023

The End