EE 313 – Linear Signals and Systems
Summer 2020

Course: EE W313; Unique Number 75530
Lecture: MWF 1130a – 100p
Final Examination: Saturday, August 15, 2020 7-10p

Instructor
Dr. Al Cuevas

Graduate Teaching Assistant

Required Text
Signals and Systems, 3rd Edition, M.J. Roberts, McGraw-Hill, 2018, McGraw-Hill (Online McGraw-Hill Connect Edition, accessed directly from Canvas).

Software
You will be required to use MATLAB in this course. MATLAB is available through the University.

Course Website
Use of the cloud-hosted learning management system, McGraw-Hill's Connect system and UT's Canvas system, will be used throughout this course. In addition, Piazza will be used for Q/A and student discussions.

Course Objectives
This course is meant to prepare you for your electrical engineering education by providing an abstraction of a large class of engineering systems and tools for analyzing them. Many fields of engineering can be reduced to creating a series of block diagrams (systems) and analyzing the properties of the signals that move through the system. By the end of this course, you will be able to analyze and design systems by simply examining their input and output signals. You will be able to compute a system output in either the time or frequency domain given the system input and a description of the system, using the Laplace, Fourier, or z-transform, as appropriate. You will understand the differences and similarities between discrete and continuous time signals and systems.

Catalog Description
Representation of signals and systems; system properties; sampling; Laplace and z-transforms; transfer functions and frequency response; convolution; stability; Fourier transform; feedback; and control applications. Computer analysis using MATLAB.

Prerequisites
Biomedical Engineering 311, Electrical Engineering 411, or 331 with a grade of at least C-; Mathematics 427J or 427K with a grade of at least C-; and credit with a grade of at least C- or registration for Mathematics 340L.

Grading Policy
The numerical course grade is computed by weighting the raw scores as indicated below. A final course grade may be adjusted on a curve rather than an absolute scale. Final grades will be assigned using plus and minus increments. A course/instructor survey will be conducted at the end of the semester via the standard MEC form for the Instructor and each Teaching Assistant.

LearnSmart Book Activities	5%
Homework & MATLAB Assignments	20%
Semester Exams (about four online exams)	45%
Final Exam (online exam)	30%

Grade Cutoffs

	A: 94%	A-: 90%
B+: 87%	B: 84%	B-: 80%
C+: 77%	C: 74%	C-: 70%
D+: 67%	D: 64%	D-: 60%
F: <60%		

Lectures
The lectures will take place at the normally scheduled time. It is anticipated each lecture will be recorded for those that may not have Internet access at the normal lecture time. These recordings should generally be available later in the same day as lecture. Attendance and participation during lecture is expected and required for examinations (see below). Questions and feedback during lecture is important.

Homework & MATLAB assignments
There will be about 12 to 15 homework assignments during the semester. Homework is completed and submitted through Connect or Canvas. No late submission will be graded. Homework will be made available on Connect, generally, a week before the due date. Announcements will be made during lecture and on Canvas regarding changes. You are responsible for checking the due dates on Canvas.

LearnSmart Book Activities
The online interactive book contains a number of Questions/Activities as part of your reading assignments. You are required to complete all activities in each assigned section. The due date for the completion of all activities for a given section/chapter will be announced in class and on the Connect website. You will not receive credit after the due date.

Examinations
There will be about four semester examinations and a final examination, all administered and proctored online. The examinations will test your knowledge of the material presented during lecture, your homework assignments, the PowerPoint slides, and the book's material. In addition, I will test your ability to apply the material presented. The four semester exams are scheduled during normal class times. The Final Exam will be scheduled per the University's Final Exam schedule and will be administered and proctored online.

The examinations will consist of a number of questions to be answered in a given time period. The exams are closed-book, closed-notes, no additional resources are to be used. All exams will be administered via Canvas and will be proctored using online monitoring resources. You must have your laptop/computer video active during the examinations. There are no make-up examinations. Excused absence from an examination must be approved in advance. Absence is excused only in extreme circumstances (serious illness, death in the immediate family, etc.). Requests for excused absences should be made in writing and must be supported by appropriate documentation. Unexcused absence from an examination will result in a grade of zero for that examination.

There is no re-grading of examinations, unless you feel that there is an error. In this case, you should submit a written (email) request. Verbal requests will not be considered. An examination grade will not be changed one week after the exam has been graded.

A basic, non-programmable, scientific calculator (e.g., TI-30Xa, TI-30X IIS, or equivalent), will be needed during the exams. You are not allowed to use a programmable or graphing calculator. For example, the TI-83, TI-84, TI-Nspire or the like, will not be permitted for use during exams.

Proposed Schedule

#	Date	Lecture Topic	Homework LearnSmart	Reading Assignment	PowerPoint Slides
1	6/05	Introduction to Signals and Systems		1.1 – 1.5	Ch1.1-25
2	6/08	Continuous-Time Signals, part 1	Connect Orientation / LS1	2.1 – 2.4	Ch2.1-28
3	6/10	Continuous-Time Signals, part 2	HW2-1	2.5 – 2.7	Ch2.29-58
4	6/12	Continuous-Time Signals, part 3	HW2-2	2.8 – 2.10	Ch2.59-68
5	6/15	Discrete-Time Signals, part 1	LS2	3.1 – 3.3	Ch3.1-14
6	6/17	Discrete-Time Signals, part 2	HW2-3	3.4 – 3.10	Ch3.15-35
7	6/19	Description of Systems, part 1	LS3	4.1 – 4.2	Ch4.1-34
8	6/22	Description of Systems, part 2	HW3	4.2 – 4.3	Ch4.35-45
9	6/24	Description of Systems, part 3 – **Exam 1**		4.3 – 4.4	Ch4.46-53
10	6/26	Time-Domain System Analysis, part 1	LS4	5.1 – 5.2	Ch5.1-24
11	6/29	Time-Domain System Analysis, part 2	HW4	5.2	Ch5.25-39
12	7/01	Time-Domain System Analysis, part 3	(ML 1)	5.2	Ch5.40-47
13	7/03	Time-Domain System Analysis, part 4	HW5-1	5.3	Ch5.48-69
14	7/06	Time-Domain System Analysis, part 5	LS5	5.3 – 5.4	Ch5.70-81
15	7/08	Continuous-Time Fourier Methods, part 1 – **Exam 2**		6.1 – 6.2	Ch6.1-27
	7/10	**No class (Final Exam for 6-week courses)**			
16	7/13	Continuous-Time Fourier Methods, part 2	HW5-2	6.2	Ch6.28-46
17	7/15	Continuous-Time Fourier Methods, part 3	(ML 2)	6.3	Ch6.47-74
18	7/17	Continuous-Time Fourier Methods, part 4	HW6	6.3 – 6.4	Ch6.75-101
19	7/20	Discrete-Time Fourier Methods, part 1	LS6	7.1 – 7.2	Ch7.1-19
20	7/22	Discrete-Time Fourier Methods, part 2	HW7	7.2	Ch7.20-35
21	7/24	Discrete-Time Fourier Methods, part 3 – **Exam 3**		7.3	Ch7.36-58
22	7/27	Discrete-Time Fourier Methods, part 4	(ML 3)	7.3 – 7.4	Ch7.59-73
23	7/29	The Laplace Transform, part 1	LS7	8.1 – 8.5	Ch8.1-14
24	7/31	The Laplace Transform, part 2	HW8-1	8.6 – 8.8	Ch8.15-32
25	8/03	The Laplace Transform, part 3	(ML 4)	8.9 – 8.10	Ch8.33-56
26	8/05	The Laplace Transform, part 4	HW8-2	8.11 – 8.14	Ch8.57-76
27	8/07	The z-Transform, part 1	LS8	9.1 – 9.7	Ch9.1-8
28	8/10	The z-Transform, part 2 – **Exam 4**		9.8 – 9.10	Ch9.9-19
29	8/12	The z-Transform, part 3	HW9	9.11	Ch9.20-33
30	8/14	The z-Transform, part 4	LS9	9.12 – 9.16	Ch9.34-47
	8/15	**Final Exam as scheduled per the University calendar**			

UNIVERSITY POLICIES

Religious Holy Days
Students shall be excused from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused will not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence. University policy required students to notify each of their instructors as far in advance of the absence as possible so that arrangements can be made.

Policy on Academic Integrity
Each student in the course is expected to abide by the University of Texas Honor Code: "As a student of The University of Texas at Austin, I shall abide by the core values of the University and uphold academic integrity." Plagiarism is taken very seriously at UT. Therefore, if you use words or ideas that are not your own (or that you have used in previous class), you must cite your sources. Plagiarism applies to all assignments in this course including software/firmware source codes.

Students who violate University rules on academic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from the University. Since such dishonesty harms the individual, all students, and the integrity of the University, policies on academic dishonesty will be strictly enforced. For further information, please visit the Student Conduct and Academic Integrity website at:http://deanofstudents.utexas.edu/conduct.

You are responsible for understanding UT's Academic Honesty and the University Honor Code.

Q Drop Policy
If you want to drop a class after the 12th class day, you'll need to execute a Q drop before the Q-drop deadline, which typically occurs near the middle of the semester. Under Texas law, you are only allowed six Q drops while you are in college at any public Texas institution. For more information, see: http://www.utexas.edu/ugs/csacc/academic/adddrop/qdrop

University Resources for Students
Your success in this class is important to me. We will all need accommodations because we all learn differently. If there are aspects of this course that prevent you from learning or exclude you, please let me know as soon as possible. Together we'll develop strategies to meet both your needs and the requirements of the course. There are also a range of resources on campus:

Services for Students with Disabilities
This class respects and welcomes students of all backgrounds, identities, and abilities. If there are circumstances that make our learning environment and activities difficult, if you have medical information that you need to share with me, or if you need specific arrangements in case the building needs to be evacuated, please let me know. I am committed to creating an effective learning environment for all students, but I can only do so if you discuss your needs with me as early as possible. I promise to maintain the confidentiality of these discussions. If appropriate, also contact Services for Students with Disabilities, 512-471-6259 (voice) or 1-866-329- 3986 (video phone). http://diversity.utexas.edu/disability/about/

Counseling and Mental Health Center
Do your best to maintain a healthy lifestyle this semester by eating well, exercising, avoiding drugs and alcohol, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress.

All of us benefit from support during times of struggle. You are not alone. There are many helpful resources available on campus and an important part of the college experience is learning how to ask for help. Asking for support sooner rather than later is often helpful.

If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, we strongly encourage you to seek support.
http://www.cmhc.utexas.edu/individualcounseling.html

The Sanger Learning Center
Did you know that more than one-third of UT undergraduate students use the Sanger Learning Center each year to improve their academic performance? All students are welcome to take advantage of Sanger Center's classes and workshops, private learning specialist appointments, peer academic coaching, and tutoring for more than 70 courses in 15 different subject areas. For more information, please visit https://ugs.utexas.edu/slc or call 512-471-3614 (JES A332).

Undergraduate Writing Center: http://uwc.utexas.edu/
Libraries: https://www.lib.utexas.edu/
ITS: https://it.utexas.edu/
Student Emergency Services: http://deanofstudents.utexas.edu/emergency/

ECE Departmental Tutoring
In collaboration with the Engineering Student Services Office, the ECE Department provides opportunities for students to receive one-on-one personalized tutoring. The ECE COMPASS Tutoring Program creates a collaborative environment that motivates each student to develop new study strategies that will better assist them with their EE coursework. Free walk-in tutoring is available for the following EE courses during the **Fall and Spring semesters**:

Courses: EE 302, EE 306, EE 411, EE 319K, EE 312, EE 313, EE 351K, M 340L (Wednesday and Thursdays only)
Days: Sunday - Thursdays: 7:00p.m.-10:00p.m.
Location: EER 0.814

More information can be found at: http://www.ece.utexas.edu/undergraduate/tutoring

Important Safety Information
If you have concerns about the safety or behavior of fellow students, TAs or Professors, call BCAL (the Behavior Concerns Advice Line): 512-232-5050. Your call can be anonymous. If something doesn't feel right – it probably isn't. Trust your instincts and share your concerns.

The following recommendations regarding emergency evacuation from the Office of Campus Safety and Security, 512-471-5767, https://financials.utexas.edu/avp-campus-safety

Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside.

- Familiarize yourself with all exit doors of each classroom and building you may occupy. Remember that the nearest exit door may not be the one you used when entering the building.
- Students requiring assistance in evacuation shall inform their instructor in writing during the first week of class.

- In the event of an evacuation, follow the instruction of faculty or class instructors. Do not re-enter a building unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services office.

- Link to information regarding emergency evacuation routes and emergency procedures can be found at: https://emergency.utexas.edu