Syllabus
MAE 143A - Signals and Systems (Winter 2021)

Catalog Description: Dynamic modeling and vector differential equations. Concepts of state, input, output. Linearization around equilibria. Laplace transform, solutions to ODEs. Transfer functions and convolution representation of dynamic systems. Discrete signals, difference equations, z-transform. Continuous and discrete Fourier transform.

Course Coordinator: Dr. Boris Kramer (bmkramer@ucsd.edu)

Teaching Assistants: Ms. Liezl Maree (lmaree@eng.ucsd.edu) and Mr. Li Tan (ltan@eng.ucsd.edu)

Class time: MWF 9:00a – 9.50a (remote, zoom)
M   6:00p – 6:50p   (remote) (4th hour, Problem session and Review)
Campus Holiday: Monday, January 18 and February 15 (No Lecture on both days)

Exams: Midterm: Wednesday February 17 (in-class)
Final: Wednesday March 17, 8.00a-11.00a

Zoom Office Hours: Monday 4:30p-5:30p (Boris Kramer) https://ucsd.zoom.us/j/99775604031
Tuesday 10:00a-11:30a (Li Tan) https://ucsd.zoom.us/j/96249994675
Thursday 10:00-11:30a (Li Tan) https://ucsd.zoom.us/j/96249994675
Thursday 4:00–5:00PM (Liezl Maree) https://ucsd.zoom.us/j/98227510096

Zoom Class Info: Before the first class, you need to register at:
https://ucsd.zoom.us/meeting/register/tJckdumrpjkvGNaWVp-pRASj3GmZKaYpR4hA
Once registered, you can use https://ucsd.zoom.us/j/96191897876 every time to join class. **Password: 143A**. Class sessions will be also recorded and made available to students asynchronously (available in Canvas within 24h of recording).

Prerequisites: MATH 20D or 21D, MATH 20E, MATH 18 or 20F or 31AH, or consent of instructor.

E-mail communication: For e-mail to instructor or TA's please put "MAE143A" **first** in the subject line.
For questions that are benefiting others (homework, exams, logistics), please use the canvas discussion board.

Textbooks/Materials:
1. *Required:* Signals & Systems: Theory and Applications, F. Ulaby and A. E. Yagle, Michigan Publishing, 2018, free download https://services.publishing.umich.edu/publications/ee/
2. *Optional:* Signals and Systems (2nd edition), Alan V Oppenheim, Alan S Willsky, Prentice Hall, 1996
3. *Optional:* Fundamentals of Signals&Systems, B. Boulet, Charles River Media, 2006, ISBN:1-58450-381-5. https://mlichouri.files.wordpress.com/2013/10/fundamentals-of-signals-and-systems.pdf

Grading: Homework 30%, Midterm 30%, Final 50%.
A 90% will guarantee an A-, 80% a B-, 70% a C- and 60% a D-.
Re-grade requests need to be made on Canvas within 48h of the return of the assignment. Appeals outside of this time frame will not be considered.

Homework is a very important part of this course. You can work together on homework problems, but your final write up must be your own work, done independently. **Homework is due weekly on Fridays, 11:59PM**, and has to be turned in on-time in Gradescope. Homework has to be turned in on-time. Late assignments within 24h of due date will be graded but the points reduced by 50%. Assignments past 24h of the deadline will get zero points.

Missing a graded assignment: If **for a documented reason** you cannot turn in your homework, then the remaining N-1 homework results will determine your homework grade. If **for a documented reason** you cannot turn in your midterm, your final grade will replace your midterm. If **for a documented reason** you cannot participate in the final exam, the instructor reserves the right to assess your grade based on an oral exam.

4th hour: During the 4th hour class, we will review topics from class and cover more exercise problems in depth, plus add some skills (MATLAB) sessions. Students are expected to attend and the material covered in the 4th hour class is important for success in homework assignments and exams.

Academic Integrity is expected of everyone at UC San Diego. This means that you must be honest, fair, responsible, respectful, and trustworthy in all of your actions. This is especially relevant now that we hold our classes and exams online. Dishonesty will not be tolerated because it undermines learning and the University's ability to certify students' knowledge and abilities. You can learn more about academic integrity at academicintegrity.ucsd.edu.

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Course Objectives: (Numbers in parenthesis refer to the specific MAE Program Outcomes)
1. To teach students the basic principles of physical signals and of the systems which modify or manipulate them. (1, 2, 6, ME8, ME9, ME10, ME11)
2. To train students to formulate and to solve Engineering problems using representations and techniques of both time and frequency domain. (1, 2, ME10, ME11)
3. To introduce the students to the concepts and some techniques of the computational analysis of signals and systems using MATLAB.(1, 2, 6, ME8, ME9)

Last Updated: December 31, 2020. The instructor reserves the right to change the syllabus at any time.