Syllabus for MAE40
Linear Circuits – Winter 2020

January 20, 2020

This is the Syllabus for MAE40 Linear Circuits – Winter 2020. Steady-state and dynamic behavior of linear, lumped-parameter electrical circuits. Kirchoff's laws. RLC circuits. Node and mesh analysis. Operational amplifiers. Signal acquisition and conditioning. Electric motors. Design applications in engineering.

Instructor

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Teaching assistants

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Prerequisites

Grades of C- or better in Math 20D, 20F and Phys 2B.

Text

The Analysis and Design of Linear Circuits, 8th Edition, R. E. Thomas, A. J. Rosa and G. J. Toussaint, Wiley 2016. ISBN 1119235383. Available on the Science and Engineering Library Reserves.

There is a custom version of the textbook which will be sold at the UCSD bookstore at a significant discount. It should be in stock in time for the class. Earlier editions of the book are also fine to use (however, homework will be assigned from the 8th edition).

Calendar

Part I

- Introduction (T & R, Chapters 1 & 2)
- Equivalent circuits (T & R, Chapters 2 & 3)
- Systematic circuit analysis (T & R, Chapter 3)
- Active circuits (T & R, Chapter 4)

Part II

- (*Laplace transform*) (T & R, Chapter 6 & 9)
- Circuits in the s-domain (T & R, Chapter 6 & 10)
- *s*-domain circuit analysis and design (T & R, Chapter 10)
- Frequency response and filter design (T & R, Chapter 12 & 14)

The website contains a list of downloadable PDFs with the slides used during the lectures so that in class you can focus on the discussion and actively understanding the material – including asking plenty of questions!

Exams

The midterm will be on Thursday, February 6, 2020, in class.

The final will be on Tuesday, March 19, 2020, 11:30am-2:30pm, in class.

Homework

There will be a set of homework problems per week taken from the main text. Homework assignments are due weekly, on Thursdays (specific dates for your reference are included in the webpage). 20% deduction for lateness by one day without reason, else 100%.

We use an all electronic homework submission and grading process through Canvas. Homework, instructions, and solutions will be posted there. You can handwrite legibly or type, then scan your homework as a PDF file for submission. Please check the quality of your PDF file before submission. If we cannot read it, we cannot grade it! Please turn in a readable and organized homework. This is a big class! Here is a suggestion: include your name and your ID # on top of each and every page, answer questions in logical order, and start answering a question always on the top of the page.

You are encouraged to ask questions about homework problems in the discussion section. You are encouraged to work in groups on homework problems but each student must turn in homework separately.

To efficiently address questions related to homework, we use Piazza at http://piazza.com/ucsd/winter2020/mae40. Answers to questions will be posted regularly, but do not expect immediate turnarounds!

Grading policy

The overall grade will be the **maximum** between

Grade 1: Final exam: 100%

Grade 2: Homework: 20%, Midterm: 30%, Final exam: 50%

Even if you count on getting the overall grade with option 1, you should still turn in all your homework. Past experiences reveal that it is nearly impossible to get a good grade in the final without having first done the homework.

Official solutions to the midterms and final exams will be posted online.

Canvas

Your grades will be available via Canvas. Check out https://canvas.ucsd.edu/courses/9721 for instructions on how to register and log in. Please **check it regularly** to make sure your homework scores are being transcribed correctly.

Academic honesty

No form of academic dishonesty will be tolerated. We take this very seriously. For the definition of academic dishonesty and its (ominous) consequences, refer to the UCSD General Catalog 2019-2020 at http://www.ucsd.edu/catalog/

Room location and hours

Lectures take place at Center Hall, room 119, Tuesdays and Thursdays, from 11:00am to 12:20pm.

Discussion sections take place at York Hall, room 2722, Wednesdays, from 8:00am to 8:50am.

Office hours

Instructor: Mondays, from 3:30pm to 4:30pm, at EBU2, room 305

Teaching assistants: Tuesdays, from 1:00pm to 2:00pm, at EBU2, room 305 (Shakeel)
Wednesdays, from 3:30pm to 4:30pm, at EBU2, room 305 (Ryan)

Course webpage

http://carmenere.ucsd.edu/jorge/teaching/mae40/w20

The webpage contains this syllabus and the list of homework due. Please check it periodically for updates and other announcements related to the course.

MAE Math Open House

The MAE Math Open House (https://sites.google.com/eng.ucsd.edu/mae-graduate-women/math-open-house?authuser=0) is open to all students enrolled in the MAE Department, regardless of grade. You bring questions, we help you understand the concepts! We are a few engineering students and faculty who want to help you build your mathematical foundation for your engineering courses. See our calendar for hours and location. If you can't come to the session, tweet or instagram us at @UCSD_MAE_Math with your question and we'll respond in 24 hours. Like our Facebook page (https://www.facebook.com/UCSDMAEmath) to post questions, get feedback, and see what your friends are asking.

IDEA Engineering Student Center

The IDEA Engineering Student Center, located just off the lobby of Jacobs Hall, is a hub for student engagement, academic enrichment, personal/professional development, leadership, community involvement, and a respectful learning environment for all. The IDEA Center offers free tutoring and a variety of other services for undergraduate and graduate students, listed in its Facebook page (https://www.facebook.com/ucsdidea) and its website (http://idea.ucsd.edu).