Syllabus for MAE40
Linear Circuits – Fall 2020

December 6, 2020

This is the Syllabus for MAE40 Linear Circuits – Fall 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: 978-1-119-23538-5.

Other editions of the book are also fine to use (however, homework will be assigned from the 8th edition). Various editions are available at the Science and Engineering Library Reserves.

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 first midterm will be on Thursday, October 29, 2020, during class.

The second midterm will be on Tuesday, November 24, 2020, during class.

The final will be on Saturday, December 19, 2020, 8:00am-11:00am.

Homework

There will be a set of homework problems per week taken from the main text. Homework assignments are due weekly, on Fridays at midnight (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 session. 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/fall2020/mae40. Answers to questions will be posted regularly, but do not expect immediate turnarounds!

Grading policy

The overall grade will be calculated as the maximum between the following two scales

Scale1: Homework: 20%, Midterm1: 25%, Midterm2: 25%, Final exam: 30%
Scale2: Homework: 20%, Midterm1: 20%, Midterm2: 20%, Final exam: 40%

Even though the hwk is only 1/5 of the total grade, past experience reveals that it is nearly impossible to get a good grade without having worked on and spent time with the homework consistently throughout the course.

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/19485 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 consequences, refer to the UCSD General Catalog 2020-2021 at http://www.ucsd.edu/catalog/

Prior to starting the course, you should visit https://academicintegrity.ucsd.edu/forms/form-pledge.html and take the UCSD Academic Integrity Pledge.

Virtual lectures and hours

Lectures and discussion sessions will be virtual throughout the quarter. They will be held on Zoom (specific access information is provided on Canvas in the announcements "Zoom Link for Lectures" and "Zoom Link for Discussion Sessions"). *Lectures* take place live on Tuesdays and Thursdays, from 2:00pm to 3:20pm, and will be recorded. *Discussion sessions* take place live on Tuesdays, from 10:00am to 10:50am, and will be recorded. All recordings will be available on Canvas.

Office hours

Specific access information is provided on Canvas in the announcement "Virtual Office Hours".

Instructor: Mondays, from 3:30pm to 4:30pm, on Zoom

Teaching assistants: Wednesdays, from 3:30pm to 4:30pm, on Zoom (Cenk)
                                    Thursdays, from 12:00pm to 1:00pm, on Zoom (Shakeel)

Course webpage

http://carmenere.ucsd.edu/jorge/teaching/mae40/f20

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

IDEA Engineering Student Center

The IDEA Engineering Student Center is a hub for student engagement, academic enrichment, personal/professional development, leadership, community involvement, and a respectful learning environment for all. The IDEA Center is currently working remotely and invites undergraduate and graduate students to connect through its Facebook page (https://www.facebook.com/ucsdidea) or Instagram page (https://www.instagram.com/ucsdidea)