MAE 40: Linear Circuits. Fall 2024.

Instructor: Sonia Martínez, `soniamd` at `ucsd` dot `edu`

Teaching Assistants:

Brooklyn Asai, `basai` at `ucsd` dot `edu`

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

This Lecture Time and Place: Mondays - Wednesdays - Fridays, 11:00am - 11:50 am, CENTR 109

Discussion Sections: Wednesdays, 4:00 - 4:50 pm, CENTR room 109

Attending the discussion sections is very advisable to pass this course and obtain a satisfactory result. Although we will solve problems in class that are similar to those in the homework and exams, the discussion sections will be entirely devoted to this task. Attending the discussion sections is not mandatory, but very much encouraged.

Office Hours:

Sonia: Wednesdays, EBU-I room 1603, 2:00pm - 3:00pm

Brooklyn: Fridays, EBU-II room 105, 1:00pm - 2:00pm

Text:

R. E. Thomas, A. J. Rosa, and G. J. Toussaint. *The Analysis and Design of Linear Circuits.* Wiley, 2023. ISBN = 978-1-119-91344-3

The homework will be assigned from the 10th edition. This book has been reserved and is available at the Science and Engineering Library.

Notes and Slides:

The website contains a list of downloadable PDF's with the slides used during the lecture, including:

Part I

– Introduction (Standard hardcover book, Chapters 1& 2)
– Equivalent circuits (Standard hardcover book, Chapters 2 & 3)
– Systematic circuit analysis (Standard hardcover book, Chapter 3)
– Active circuits (Standard hardcover book, Chapter 4)

Part II

– Laplace transform (Standard hardcover book, Chapters 9 & 6)
– Circuits in the s-domain (Standard hardcover book, Chapters 6 & 10)
– S-domain circuit analysis (Standard hardcover book, Chapter 10)
– Frequency response and filter design (Standard hardcover book, Chapters 17 & 14)

It is highly recommended that your reading of the book is one set of slides ahead of what we cover in class.

Notes on demos carried out in class:

myDAQ Notes:

- Equivalent circuits
- Operational amplifiers
- Audio mixer
- Low pass filter

Homework:

There will be a set of homework 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 will use an all electronic homework submission and grading process through Gradescope (within 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 their homework separately. To address questions related to homework, we will use Piazza (available from canvas). Answers to questions will be posted regularly, but please do not expect immediate turnarounds.

From time to time, there will be a brief handout given in class to be submitted to Canvas on the same day. The problem and its solution will be discussed in class, and you just need to make sure to turn it in time.

Course website:

http://muro.ucsd.edu/sonia/teaching/mae40-F2024/index.html

The website contains the syllabus, the list of homework due, and sets of slides. However, we will make announcements and post more recent information on canvas.

Exam Dates:

- Midtem exam 1: Oct 23, in class
- Midterm exam 2: Nov 20, in class
- Final: Dec 10, 2024, Time: 11:30am to 2:29pm. Location TBA

Grading Policy:

Your grade will be the maximum of the following two options.
Option 1 = 0.20 * homework + 0.25 * midterm1 +0.25*midterm2 + 0.30*final
Option 2 = 0.20 * homework + 0.20 * midterm1 +0.20*midterm2 + 0.40*final

That is, your Final Grade (FG) will be:
    FG = max(Option 1, Option 2)
Note: Even if the overall percentage of the homework is low, it is very much recommended that you keep turning in all the homeworks. This is key to do well in the final.

Canvas:

Your grades and all material will be available to you via canvas. The canvas section number for this course is 59478.

Math Open House:

This program brings you free weekly math tutoring from graduate students in the MAE department. It is student-run and aims to connect you with graduate students who can help you improve your math skills. Weekly sessions on Wednesdays 4-5pm and Thursdays 5-6pm until the end of the quarter. All sessions will be held in EBU2 270. Discord server set up `discord.gg/uWw9gvX9NM`

Triton Testing Center:

The Triton Testing Center is able to assist with accommodated testing, make-up testing, & other situations where a student needs to test outside of a classroom but within a proctored setting. Please **let the instructor know that you need an accommodation at least 10 days in advance**, so that the class can be registered and the exam uploaded in time.

Academic Honesty:

No form of academic dishonesty will be tolerated. Specifically, in this course, **the use of Chapt-GPT** or other **GenAI tools** to solve homework problems or other assignments **is not allowed** and constitutes cheating. To avoid problems, please do not turn in exact homework copies but your own solutions. Copying from previous homework solutions is also considered cheating. For the definition of academic dishonesty and its consequences refer to the Student Conduct Code available at the website `https://academicintegrity.ucsd.edu`

A final word of advise:

Use of the resources you are given to learn and understand the material of the course! Read the book/slides before attending the lectures, do the homework, ask questions in class or in the office hours, email me or the TAs with questions, consult other books, ask other students, use the university resources. After each class, make sure that you have understood the concepts taught. If you have questions, don't be shy and ask! Everything is on your side to help you master this linear circuits course.