

# Syllabus for MAE140

## Linear Circuits – Winter 2017

March 6, 2017

This is the Syllabus for MAE140 Linear Circuits – Winter 2017. 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

Jorge Cortés, `cortes at ucsd.edu`, office at EBUI #1608

### Teaching assistants

Eduardo Ramirez, `ejr003 at eng.ucsd.edu`

### 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.

**Important:** 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.

### 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 Friday, February 9, 2017, in class.

The final will be on Tuesday, March 21, 2017, 11:30am-2:30pm, at Center Hall (Map Building 984), room 101.

## Homework

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

Homework must be stapled, be written legibly and in logical order. You must include your name, your ID #, and the assignment. 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 and answers related to homework, we will use Piazza at <http://piazza.com/ucsd/winter2017/mae140>

You can retrieve already graded homework from the TA's office at EBU1 2113.

## 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.

## TritonEd

Your grades will be available via TritonEd. Check out <http://triton.ed.ucsd.edu> 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 Catalogue 2016-2017 at <http://www.ucsd.edu/catalog/>

## Room location and hours

*Lectures* take place at Center Hall (Map Building 984), room 113, Tuesdays and Thursdays, from 12:30pm to 1:50pm.

*Discussion sections* take place at Center Hall (Map Building 984), room 109, Fridays, from 3:00pm to 3:50pm.

## Office hours

Instructor: Thursdays, from 3:30pm to 4:30pm, at EBUII, room 105

Teaching assistant: Mondays, from 3:30pm to 4:30pm, at EBUII, room 305

## Course webpage

<http://carmenere.ucsd.edu/jorge/teaching/mae140/w17>

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/a/eng.ucsd.edu/mae-math-open-house/home>) 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 Student Center**

The IDEA Student Center (<http://idea.ucsd.edu>), located just to the right of 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 Learning Center, located in Jacobs Hall Room B805 (basement), offers free tutoring through our Learning Communities program.