

Syllabus for MAE143a

Signals and Systems - Winter 2011

January 12, 2011

This is the Syllabus for MAE143a - Signals and Systems, Winter 2011. 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.

Instructors

Jorge Cortés, `cortes at ucsd.edu`

Mauricio de Oliveira, `mauricio at ucsd.edu`

Teaching assistants

Svetlana Broyda, `sbroyda at ucsd.edu`

Jeanie Kwok, `jckwok at ucsd.edu`

Chien Wei Lee, `ch1099 at ucsd.edu`

Qian Ding, `qding at ucsd.edu`

Prerequisites

Grades of C- or better in Math. 20D, 20E, and 20F and MAE 105.

Text

Fundamentals of Signals and Systems, 1st Edition, M. J. Roberts, McGraw-Hill, 2008. ISBN 9780073404547. Available on the Science and Engineering Library Reserves.

Calendar

Both MAE143a sections (# 701355 and # 713649) will be taught in a coordinated way. This means that the instructors will cover roughly the same material each week. The website will contain a list of downloadable PDFs with the slides used during the lectures. The following schedule is orientative

Part I

- Introduction (R, Chapters 1)
- Continuous-time and discrete-time signals (R, Chapters 2 & 3)
- Properties of continuous-time and discrete-time systems (R, Chapters 4 & 5)
- Time-domain analysis (R, Chapters 6 & 7)
- Laplace transform (R, Chapter 15)

Part II

- Fourier series (R, Chapters 8 & 9)
- Fourier transforms (R, Chapters 10 & 11)
- Filtering (R, Chapters 12 & 13)
- Sampling (R, Chapter 14)
- z-transform (R, Chapter 16)

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

Exams

The midterm will be on Wednesday, February 2, 2011, at Center Hall, room 214.

The final will be on Friday, March 18, 2011, 11:30am-2:30pm, at TBD.

Homework

There will be a set of homework problems per week taken from the main text. The homework will be collected and returned on Fridays. 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 and **MUST** be written legibly and in logical order. You **MUST** include your name (print it!), your professor's 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.

Grading policy

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

Grade 1: Final exam: 60%, Final project: 40%

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

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 midterm and final exams will be posted online.

WebCT

Your grades will be available via WebCT. Check out <http://webct.ucsd.edu> for instructions on how to register and log in.

Academic honesty

No form of academic dishonesty will be tolerated. For the definition of academic dishonesty and its (ominous) consequences, refer to the UCSD General Catalogue 2010-2011 at <http://www.ucsd.edu/catalog/front/content.html>

Room location and hours

Lectures of section # 701355 take place at Pepper Canyon Hall (Map Building 780), room 106, Mondays, Wednesdays and Fridays, from 1:00pm to 1:50pm.

Lectures of section # 713649 take place at Center Hall (Map Building 984), room 101, Tuesdays and Thursdays, from 3:30pm to 4:50pm.

Discussion sections take place at Center Hall (Map Building 984), room 214, Wednesdays, from 10:00am to 10:50am.

Office hours

Jorge: Fridays, from 2:00pm to 3:00pm, at EBUII, room 305

Mauricio: Thursdays, from 2:00pm to 3:00pm, at EBUII, room 305

Svetlana: Wednesdays, from 11:00am to 12:00pm, at EBUII, room 105

Jeanie: Mondays, from 2:00pm to 3:00pm, at EBUII, room 305

Chien: Wednesdays, from 2:00pm to 3:00pm, at EBUII, room 105

Qian: Tuesdays, from 2:00pm to 3:00pm, at EBUII, room 305

Course webpages

<http://tintoretto.ucsd.edu/jorge/teaching/mae143a/>

<http://maecourses.ucsd.edu/~mdeolive/mae143a/>

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