

ENAS 194a: Ordinary and Partial Differential Equations with Applications (Fall 2010)

Venue and time: Tue/Thu 1:00pm-2:15pm in Becton 102

Web page: See ENAS 194 at classesv2.yale.edu

Prerequisites: Math 120a or b or ENAS 151 a or b and some knowledge of matrices

Textbook: *Elementary Differential Equations and Boundary Value Problems*,
by W. E. Boyce and R. C. DiPrima, 9th edition (Wiley).

Instructor: Sohrab Ismail-Beigi, sohrab.ismail-beigi@yale.edu, 432-2107, Becton 307
office hours: Becton 307, Wednesdays 6pm-7:30pm

TFs: Matthew Herdiech, matthew.herdiech@yale.edu, 432-9670, Malone 001B
office hours: Becton 508, Tuesdays 7pm-8pm

Michael Kanik, michael.kanik@yale.edu, 432-4257, Becton 216
office hours: Becton 508, Mondays 5pm-6pm

Weekly review session: two, one-hour sessions each week
Mondays 4pm-5pm and Tuesdays 8pm-9pm in Becton 508

Weekly problem sets: 40% of the course grade. They are due on Thursdays at the start of lecture. Late work handed in by start of lecture the following Tuesday is graded out of a maximum of 50%; no credit is given thereafter. To receive full credit on problems, you must show the logic and steps in your solution and not merely reproduce the final answer. Solutions will be posted online on [classesv2](http://classesv2.yale.edu) and graded problem sets will be returned within a week.

Exams: Two midterms, each worth 18% of the course grade, will be on the evenings of Oct. 5th and Nov. 16th. Final exam, at 2pm on Dec. 14th, is worth 18% of the course grade.

Weekly review sessions: 6% of course grade. Each week there will be two one-hour sessions (you only need to go to one per week). You must attend 3/4 of the sessions. Sessions start with a short 5-10 minute quiz presenting problems to be discussed and solved. Your performance on the quiz is not recorded and will not affect your grade — quizzes are tools to check attendance, have you think about the material, and come up with questions for discussion.

The only acceptable excuses for missed exams, late homeworks, or missed review sessions are written dean's excuses and permission of the instructor.

Outline: We will cover most of Chapters 1-6 and 10 of the textbook. Time permitting, we will cover Chapters 7 and 11. Our emphasis is on *solving* a variety of differential equations, and we will be learning and practicing a variety of techniques. The main topics are:

- First order differential equations
- Second order linear differential equations
- Higher order linear differential equations
- Laplace transforms
- Series solutions of second order linear differential equations
- Partial differential equations and Fourier series
- Systems of first order linear differential equations (time permitting)
- Boundary value problems (time permitting)

This is a great deal of material! The pace will be **rapid** and will require a good deal of effort on your part. In return, you will gain a solid basic understanding of differential equations: the mathematical framework used to describe the widest variety of phenomena in the real world.