

Math 2280: Introduction to Differential Equations- Syllabus

University of Utah

Spring 2013

1 Basic Information

Instructor - Patrick *Dylan* Zwick

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Phone - 801-651-8768

Office Hour - Thursdays, 8:35 AM to 9:25 AM.

Office - JWB Math Building Room 129

Webpage - <http://www.math.utah.edu/~zwick/>

Meeting Time - MTWF 8:35 AM - 9:25 AM

Meeting Location - LCB (LeRoy Cowles Building) Room 215

Textbook - *Differential Equations and Boundary Value Problems*
by Edwards and Penney, 4th Edition

2 Course Objectives

The objective of this course is to teach you ordinary differential equations! Or, at least, the basics of ordinary differential equations (it's a huge and difficult subject, and the focus of much active research today!) By the end of the semester you should have a firm understanding of the basic concepts of differential equations; what a differential equation is, how to solve linear differential equations, how to solve systems of linear differential equations, some basic numeric methods, Laplace transforms, power

series methods, and Fourier series methods. By the final exam you should understand what all these concepts mean, and know how to use them to solve problems.

3 Course Overview

This is the second in a two-semester sequence of classes designed for undergraduate math, science, and engineering majors who want to get a very firm understanding of linear algebra and differential equations. Math 2280, the second in the sequence, covers the differential equations part. I will assume you have a firm understanding of calculus and linear algebra.

We'll be working our way through most of Edwards and Penney's textbook at the rate of approximately one section per lecture. We have four classes each week, and we'll get through most of the book. This class moves fast and we cover a lot of material, so please be prepared!

We'll be learning the foundations and important ideas behind differential equations, along with how to solve them. In the "real world" these problems come up *all the time*. So, it's important that you understand this material.

As mentioned above, we'll be following the textbook pretty closely. However, I will be writing up lecture notes, and these will be posted on the class website. I'll try to stay a few days ahead with my notes. You should download the lecture notes, print them out, and use them to follow along during class. If you can, try to read them before class. In these notes I won't include solutions to example problems. I'll just leave some blank space for you to write the solution down as I go over it. You have to have something to do during lecture! However, in case you can't be there, once the lecture is over I'll post lecture notes that include the worked example problems.

Please note that all the material for the class will be posted on the class webpage, along with announcements and review material. It's an important resource for this class, so please use it.

I'm looking forward to a good class. I hope you are too!

4 Homework and Exams

4.1 Homework

We'll have weekly homework assignments. The assignments will be announced in class and posted online each Monday, and due the following Monday. A subset of these problems, usually two or three, will be graded each week by a grader. There will also be suggested additional problems. These problems are optional, and will not be graded, but are a good resource in case you want to work more problems to get a stronger understanding of the material.

I will be posting solutions to each homework assignment the Wednesday after it is due. These solutions will include solutions to the recommended problems. I will usually not accept late homework, but I will definitely not accept late homework after the solutions have been posted. In calculating your final grade, I will drop your lowest homework score, so if extenuating circumstances come up and you can't get one of the homework assignments done, you'll be able to drop it.

4.2 Exams

We will have an in-class exam approximately every four weeks, and a comprehensive final exam at the end of the semester. In calculating your final grade I will drop your lowest exam score (of the four during the semester, not the final). So, if you need to miss one of the exams for any reason, or do particularly badly on one exam, it won't ruin your final grade.

4.3 Grades

The grade breakdown for the class will be:

Homework - 25%
Exams - 45%
Final - 30%

I already let you drop your lowest exam score. If you do better on the final than on your next lowest exam score, I'll replace the second lowest

exam score with your final exam score, effectively dropping the second lowest exam and making the final worth 45%.

What percentage ranges will map to what grades is not predetermined, and will be decided based upon class scores and the difficulty of the exams. I guarantee that anything higher than a 93% will be an A.

5 Students with Disabilities

The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements and accommodations.

6 Schedule

Here is the tentative schedule for the class. Please note this schedule is not set in stone, and may change depending on the dynamics of the class.

January 7th - Introduction and Edwards and Penney Section 1.1

January 8th - Edwards and Penney Section 1.2

January 9th - Edwards and Penney Section 1.3

January 11th - Edwards and Penney Section 1.4

January 14th - Edwards and Penney Section 1.5

January 15th - Edwards and Penney Section 1.6

January 16th - Edwards and Penney Section 2.1

January 18th - No Class

January 21st - **Martin Luther King Jr. Day** (No Class)

January 22nd - Edwards and Penney Section 2.2

January 23rd - Review

January 25th - *Exam 1*

January 28th - Edwards and Penney Section 2.3

January 29th - Edwards and Penney Section 2.4

January 30th - Edwards and Penney Section 3.1
February 1st - Edwards and Penney Section 3.2

February 4th - Edwards and Penney Section 3.3
February 5th - Edwards and Penney Section 3.4
February 6th - Edwards and Penney Section 3.5
February 8th - Edwards and Penney Section 3.6

February 11th - Edwards and Penney Section 3.7
February 12th - Edwards and Penney Section 3.8
February 13th - Review
February 15th - *Exam 2*

February 18th - **President's Day** (No Class)
February 19th - Edwards and Penney Section 4.1
February 20th - Edwards and Penney Section 4.2
February 22nd - Edwards and Penney Section 4.3

February 25th - Edwards and Penney Section 5.1
February 26th - Edwards and Penney Section 5.2
February 27th - Edwards and Penney Section 5.3
March 1st - Edwards and Penney Section 5.4

March 4th - Edwards and Penney Section 5.5
March 5th - Edwards and Penney Section 5.6
March 6th - Review
March 8th - *Exam 3*

March 11th - **Spring Break** (No Class)
March 12th - **Spring Break** (No Class)
March 13th - **Spring Break** (No Class)
March 15th - **Spring Break** (Still No Class)

March 18th - Edwards and Penney Section 7.1
March 19th - Edwards and Penney Section 7.2
March 20th - Edwards and Penney Section 7.3
March 22nd - Edwards and Penney Section 7.4

March 25th - Edwards and Penney Section 7.5
March 26th - Edwards and Penney Section 7.6
March 27th - Edwards and Penney Section 8.1
March 29th - Edwards and Penney Section 8.2

April 1st - Edwards and Penney Section 8.3

April 2nd - Edwards and Penney Section 8.4

April 3rd - Review

April 5th - *Exam 4*

April 8th - Edwards and Penney Section 8.5

April 9th - Edwards and Penney Section 8.6

April 10th - Edwards and Penney Section 9.1

April 12th - Edwards and Penney Section 9.2

April 15th - Edwards and Penney Section 9.3

April 16th - Edwards and Penney Section 9.4

April 17th - Edwards and Penney Section 9.5

April 19th - Edwards and Penney Section 9.6

April 22nd - Edwards and Penney Section 9.7

April 23rd - Review

April 24th - Review

Final Exam is on Tuesday, April 30th, 2013 from 8:00 AM to 10:00 AM.