Math 2280: Introduction to Differential Equations- Syllabus

University of Utah

Fall 2013

1   Basic Information

Instructor - Patrick *Dylan* Zwick
 Email - zwick@math.utah.edu
 Phone - 801-651-8768
 Office Hours - 3:00 PM to 4:00 PM M and 8:35 AM to 9:35 AM H.
 Office - JWB Math Building Room 129
 Webpage - http://www.math.utah.edu/∼zwick/

 Meeting Time - *MTWF* 8:35 AM - 9:25 AM
 Meeting Location - AEB (Alfred Emery Building) Room 350 MWF,
        BEH S (Behavioral Sciences Building) Room 106 T

 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, 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 much 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 usually be due on Friday, and will be posted at least a week before they're due. A subset of the assigned problems, usually two or three, will be graded each week by a grader.

I will be posting solutions to each homework assignment. 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.

4.2 Exams

We will have an in-class exam approximately every three 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 three 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 - 40%
Final - 35%

I already let you drop your lowest exam score. If you do better on the final than on your next lowest exam, I'll replace the second lowest exam score with your final exam score, effectively dropping the second lowest exam and making the final worth 55%.

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 accomodations.

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.

August 26th - Introduction and Edwards and Penney Section 1.1
August 27th - Edwards and Penney Section 1.2
August 28th - No Class
August 30th - No Class

September 2nd - **Labor Day** (No Class)
September 3rd - Edwards and Penney Section 1.3
September 4th - Edwards and Penney Section 1.4
September 6th - Edwards and Penney Section 1.5

September 9th - Edwards and Penney Section 1.6
September 10th - Edwards and Penney Section 2.1
September 11th - Edwards and Penney Section 2.2
September 13th - Edwards and Penney Section 2.3

September 16th - Edwards and Penney Section 2.4
September 17th - Edwards and Penney Section 3.1
September 18th - Review
September 20th - *Exam 1*

September 23rd - Edwards and Penney Section 3.2
September 24th - Edwards and Penney Section 3.3
September 25th - Edwards and Penney Section 3.4
September 27th - Edwards and Penney Section 3.5

September 30th - Edwards and Penney Section 3.6
October 1st - Edwards and Penney Section 3.7
October 2nd - Edwards and Penney Section 3.8
October 4th - Edwards and Penney Section 4.1

October 7th - Edwards and Penney Section 4.2
October 8th - Edwards and Penney Section 5.1
October 9th - Edwards and Penney Section 5.2
October 11th - Edwards and Penney Section 5.4

October 14th - No Class (Fall Break)
October 15th - No Class (Fall Break)
October 16th - No Class (Fall Break)
October 18th - Still No Class (Fall Break)

October 21st - Edwards and Penney Section 5.5
October 22nd - Edwards and Penney Section 5.6
October 23rd - Review
October 25th - *Exam 2*

October 28th - Edwards and Penney Section 7.1
October 29th - Edwards and Penney Section 7.2
October 30th - Edwards and Penney Section 7.3
November 1st - Edwards and Penney Section 7.4

November 4th - Edwards and Penney Section 7.5
November 5th - Special Mathematics of Voting Lecture
November 6th - Edwards and Penney Section 7.6
November 8th - Edwards and Penney Section 8.1

November 11th - Edwards and Penney Section 8.2
November 12th - Edwards and Penney Section 8.3
November 13th - Edwards and Penney Section 8.4
November 15th - Edwards and Penney Section 8.5

November 18th - Edwards and Penney section 9.1
November 19th - Edwards and Penney Section 9.2
November 20th - Edwards and Penney Section 9.3
November 22nd - Edwards and Penney Section 9.5

November 25th - Edwards and Penney Section 9.5
November 26th - Review

November 27th - *Exam 3*
November 29th - No Class (Thanksgiving Break)

December 2nd - Edwards and Penney Section 9.6
December 3rd - Edwards and Penney Section 9.7
December 4th - Edwards and Penney Section 6.1
December 6th - Edwards and Penney Section 6.2

December 9th - Edwards and Penney Section 6.3
December 10th - Edwards and Penney Section 6.5
December 11th - Review
December 13th - Review

Final Exam is on Tuesday, December 17th, 2013 from 8:00 AM to 10:00 AM in our usual classroom.