MATH 244, Section C1 – Summer 2017
Syllabus

Instructor – Matt Charnley

Office: Hill 606, Busch Campus
Course Website - Canvas: canvas.rutgers.edu
Personal Website: math.rutgers.edu/~mpc163/Courses/SM17_MATH244.html

Class Meetings

MTWTh, 8:00 AM – 10:00 AM, Tillett 204, Livingston Campus

Office Hours

Monday and Wednesday – 10:00 AM – 12:00 noon, LSH 102C
By Appointment - Hill 606, Busch Campus

Exam Schedule

Midterm 1: Thursday, June 15 – In Class
Midterm 2: Thursday, July 6 – In Class
Final Exam: Thursday, July 20 – 8:00 AM – 11:00 AM

Course Information

The information for this course can be found on Canvas. Canvas is a newer Learning Management System that Rutgers is looking to implement in their classes. While I haven't used it for an actual class before, I feel like it's a lot better than Sakai, and I hope you'll like it too. The website is canvas.rutgers.edu. For the first week or so, I will also be posting links to everything on my personal website math.rutgers.edu/~mpc163/Courses/SM17_MATH244.html to allow everyone to keep up with the class if there are any issues with the Canvas site. After that, we will be exclusively using Canvas. If there are any issues, let me know as soon as possible.

Textbook

The textbook for this course is *Elementary Differential Equations*, **10th edition**. William Boyce and Richard DiPrima. ISBN: 978-0-470-45832-7.

Class Summary

This class is an introduction to Ordinary Differential Equations. In particular, this class is directed at engineering and physics students who will need knowledge of ordinary differential equations for future classes. To best do this, the class will focus on both the qualitative and quantitative aspects of differential equations, showing how both can be useful in different situations. There will be some instances where it may seem like the math has no connection to engineering or physics, but there will always be an attempt to emphasize the applications at every step. The topics covered in this class include:

- First Order Differential Equations
- Second and Higher Order Linear Differential Equations
- Systems of First Order Differential Equations
- Numerical Methods for Solving Differential Equations
- Non-Linear Differential Equations

Grade Breakdown

The final grades for this course will be calculated using the following distribution

Worksheets / Participation / Presentations	10%
Homework Writeups	5%
Quizzes (Including Syllabus Quiz)	10%
Projects and Maple Labs	15%
Midterms	28% (14% each)
Final Exam	32%

Note: No student will receive a final grade more than one mark higher than their average grade on the 3 exams, weighted in an appropriate manner. For instance, if your average exam grade is a C, you can receive no higher than a B for a final grade.

Class Structure

This class will be run as a flipped classroom. What this means is that the process of learning basic concepts and content (normally done via lecture) will be done on your own outside of class, and the practice of problem solving (normally done as homework) will be done in class when I am present to help you. The learning process outside of class will be facilitated by videos that I will be making over the course of the summer and worksheets that I will give you corresponding to both sections in the textbook and these videos. The worksheets will be due at the start of each class, at which point is expected that you will have read the sections in the textbook and completed the worksheet. These worksheets will contain questions about the important parts of the textbook sections as well as a few simple problems to get you started. Class will consist of a short lecture discussing the material and answering any questions from the previous night's reading, followed by group problem solving work. This will be similar to the workshop process in Calculus 1 and 2. The end of class will either consist of presentations or quizzes. The last page in this syllabus outlines the general process for a given class period.

Academic Integrity

All students in this course are expected to be familiar with and abide by the academic integrity policy (http://academicintegrity.rutgers.edu/academic-integrity-at-rutgers). Violations of this policy are taken very seriously. In short, don't cheat, and don't plagiarize. In terms of exams, it's fairly easy to understand what cheating/plagiarism is. However, this class is going to be heavily based on group work and projects. Everyone is expected to submit their own work, which means copying or borrowing answers from someone else in the class is plagiarism. Since you are expected to work together for some of the problems, this can be tricky. The general method that you should use in this class is that during the group work, you should only write notes about the problems, but don't work on the actual write-up. Then, outside of class, you can do the write-up using your notes, which will result in your write up still coming from the work you did in class, but will not be identical to your classmates. See the Canvas page for more information.

Attendance

Attendance at every class meeting is mandatory. Attendance will be taken in the form of the worksheets at the beginning of class and participation points for the problems solved in class. You are also expected to watch all of the videos that I link on the Canvas page. With the speed of all summer classes, missing any class will result in you falling significantly behind. If you must miss a class for any reason, come talk to me as soon as possible.

Problem Sets

The in-class problem sets will consist of three parts. The first, 'Warm-ups,' consists of problems that give a basic idea of the topics. All groups in the class should do all of these problems, or at least verify that they know how to do all of them. These are all fair game for quiz and exam questions. The second section, 'Exercises,' are a little more complicated and involved. These are the problems that will be presented at the end of class (see the Presentations section), and problems similar to these are around the level of exam questions. The final section, 'Problems,' are more involved and multi-step problems. These will be turned in as a part of the homework write-ups (see the Homework section).

Presentations

Whenever there is not a quiz at the end of class, there will be in-class presentations of the problems that were worked on that day. Each group will get a different problem to work through (assigned around the middle of class), and one person from the group will need to present it to the class in the last 30 minutes of class. The person presenting at the board will need to rotate every time a presentation is done, but the entire group can help in presenting the problem or giving guidance from their seats. The entire group can also work together to write the solution on the board before the presentation, and then only one person will talk through it to the class. The goal here is to build confidence in talking about the course material, as well as give everyone practice talking about math.

Quizzes

Every Tuesday and Thursday class (except exam days) will end with a quiz. This quiz will cover material from the previous two days of class, but can also be more cumulative depending on the situation. The problems on the quizzes will be on a comparable level to the in-class exercises. They will be closed book, closed note, individual quizzes. The first quiz is already posted on Canvas. It is a quiz about this syllabus and how the class is structured. It is worth triple of all of the other quizzes, and can not be dropped. It is due at the end of the day on Tuesday, June 6. You have unlimited attempts to get it right, and can use this syllabus and the Canvas website while you are taking the quiz.

Homework

Homework for this class will not be assigned in the typical manner. Before each class, you will be expected to complete a worksheet summarizing sections in the textbook. There will also be problems on here to be completed from the videos that you need to watch. This will be due at the start of class, graded during class, and returned to you the same day. At the end of each class, approximately one problem from each homework set covered that day will be assigned. These will need to be written up individually, although you will be doing the problems in groups, so you are definitely welcome to talk about the problems as you do them. The write-ups should be fairly complete, somewhere between workshops and normal homework. The write-ups should also be your own work, completed without collaborating with other students. These will be graded and returned to you.

Maple Assignments

There are 3 Maple labs that will need to be completed and turned in over the course of the summer. The dates are included in the tentative schedule below, and all of the necessary materials will be posted to Canvas. There will also be some introductory materials posted there if you need more information. If you have any issues with the Maple labs, come talk to me in office hours or send me an email. I will briefly mention each of them as they are assigned, but you will be overall responsible for completing them on your own, and coming to me with any questions. I will be spending minimal in-class time discussing the Maple labs.

Projects

There will be two projects assigned over the course of the summer. The due dates for these projects are in the schedule at the end of the syllabus. These projects will be somewhat similar to lab reports, in that math and writing will be incorporated together into a single document. You will need to both present solutions to the given math problems and discuss the implications of the results in an actual situation. The project description will make it clear what you are expected to talk about and how to use the mathematical results to do so. The idea with the projects is to show you how the math you do in this class is applicable to physical situations and understand yourself how to do these applications. The projects will be done individually, although you are allowed to discuss it with both me and your fellow students.

Exams

There will be two midterm exams and a final exam. The dates for these exams are posted above as well as on the tentative schedule below, but are subject to change. These will be exams in the standard sense, 80 minutes for the midterms and 180 minutes for the final, and will be taken individually. Calculators and electronic devices will not be permitted on the exams, and they will be closed book and closed note.

Make-Up Policies

There will be no make-ups for any of the in-class activities or homework assignments. In order to compensate for this, the lowest quiz, lowest 2 worksheets, and lowest 2 homework grades will be dropped at the end of the summer. Under no circumstances can an exam be made up after the fact. If there is a legitimate reason for missing an exam, i.e., doctor's note, then we can discuss possibilities moving forward, but you will not be able to take the exam later. If there is an excessive need to miss class, talk to me about it sooner rather than later.

Disability Accommodations

I will be happy to provide appropriate accommodations for students who provide me with a letter of accommodation from the Office of Disability Services (ODS). For more information, see http://ods.rutgers.edu/.

Changes

This syllabus is subject to change at any point. Any changes will be announced in class and posted on the Canvas site.

Tentative Class Schedule

DATE	SECTIONS	DUE DATES
5/30	1.1, 1.3	
5/31	1.2, 2.2	
6/1	2.1	Quiz
6/5	2.3	
6/6	2.4, 2.8	Quiz
6/7	2.5	
6/8	2.6	Quiz
6/12	2.9	Project 1 Due
6/13	3.1, 3.2	Quiz
6/14	5.4, Review	
6/15	MIDTERM 1	
6/19	2.7, 8.1-8.3	Maple 1 Due
6/20	3.3, 3.4	Quiz
6/21	3.7	
6/22	3.5, 3.6	Quiz
6/26	3.8	Project 2 Due
6/27	Chapter 7, Day 1	Quiz
6/28	Chapter 7, Day 2	
6/29	7.5, 7.6	Quiz
7/3	7.8, 9.1	
7/4	NO CLASS	NO CLASS
7/5	C7, Day 3, Review	
7/6	MIDTERM 2	
7/10	7.7	Maple 2 Due
7/11	7.9	Quiz
7/12	9.2, 9.3	
7/13	9.4, 9.5	Quiz
7/17	9.7, 9.8	Maple 3 Due
7/18	Chapter 4 and 5 Summary	Quiz
7/19	Review	
7/20	FINAL EXAM	

Class Structure

Outside of Class:

1. Read assigned sections in the textbook.
2. Watch the corresponding videos through Canvas.
3. Fill out the worksheet and complete the problems from the videos.
4. Complete in-class problem write-up.

In Class:

1. Turn in worksheet, previous class's homework, and ask any questions from the previous sections.
2. Listen to brief lecture about the material.
3. Work on book problems or other assigned problems in groups.
4. Ask questions about the problems as needed.
5. Midway through class, end of class and homework assignment will be discussed.
6. Class will end with either presentations or a quiz.

Worksheets will be returned the same day they are collected. Homework assignments will be returned a day later.