

Spring 2-1-2018

## M 263.01: Applied Differential Equations

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Department of Mathematical Sciences  
Spring 2018  
Applied Ordinary Differential Equations

**Instructor:** Professor Emily Stone      **E-mail Address:** emily.stone@umontana.edu  
**Office:** MATH 004B      **Office Phone:** 243-5365  
**Office Hours:** MWF 11-12, or by appointment

**Course Description:** In this course we will cover analytic solution techniques for first order differential equations (ODEs) and second order linear differential equations. We will also study numerical methods for constructing approximate solutions to ODEs, and qualitative methods for studying nonlinear systems, namely phase plane analysis. Modeling simple systems governed by ODEs will be introduced, along with the general analysis of linear systems of ODEs.

**Texts:** • *Differential Equations*  
Blanchard, Devaney and Hall, 4th Ed., J. Wiley

**Prerequisite:** Math 162 Applied Calculus

**Important Dates:**

Jan. 30	Last day to add a course via Cyberbear
Feb. 9:	Last day to drop/change grading option via Cyberbear
Feb. 19:	Presidents Day - no classes
March 26-30:	Spring Break - no classes
April 2:	Last day to drop/change grading option with form
May 4:	Last day for Drop Petitions, grading option change forms.

**Exams:**

March 14 (Wed.) <i>Tentative:</i>	Mid-term Exam
May 4 (Friday):	Final Exam, 10:10-12:10

**Grading:**

Homework (~ 12)	25% of course grade
Exams (2)	50% of course grade
Lab Reports (~ 5)	25% of course grade

SOME COMMENTS

**Homework Assignments:**

A computer or calculator may be used to aid with the calculations in the homework. We will use Maple in class, which is widely available on campus, and I will give you worksheets with examples of the types of calculations you will be required to do for the class. However, Maple is not the only software package out there with these capabilities, and you are welcome to use whatever package suits you. You are encouraged to work together on the assignments, but please write up the solutions individually.

*Written Homework assignments will be due on Wednesdays by 2:00 p.m. Homework received on Thursday by 2:00 p.m. will receive a 25% deduction, on Friday by 2:00 p.m., a 50% deduction. Homework will not be accepted any later than Friday.* You may hand in your assignment in class, or

you can place it in the homework box in the main office, MATH 111. Please have your assignments stapled or paper-clipped on 8.5 by 11 inch paper.

### **Lab Assignments:**

We will be doing 4-5 labs during class time spread throughout the semester. You will work in a small group on a project at that time, and then write up your results individually as a lab report. The labs I currently have planned are found in the textbook, so have a look. They are: Lab 1.1 (p. 142), Lab 2.2 (p. 230), Lab 3.4 (p. 384), Lab 4.2 (p. 453), Lab 5.3 (p. 561). These will prepare you to analyze DEs in an actual problem and write up a coherent report on your findings.

### **Readings:**

In mathematics lectures, a new term is often defined at the beginning of the class period and then used repeatedly throughout the session. It is helpful to be prepared for class by reading the text ahead of time. Thus, when a new topic is introduced in class, it is *not* the first time you have seen it! The reading assignments are designed to help you make better use of class time, they are to be done *before* the material is covered in class. There are also many, many online resources for differential equations, including lectures on topics that we will be covering in class. I will post ones I think are good on our website, and if you have suggestions that you think other students might find useful, please let me know.

### **Exam Information:**

There will be one in-class exam and a final given on the dates listed at the bottom of the first page of this syllabus. The final exam will be cumulative with a slight emphasis on the material covered after the midterm test. Make-ups for an exam will not be given unless you have a valid excuse and you contact me prior to the exam.

### **Grading:**

Grading will be done on the usual percentage scale, 90-100% A, 80-89 % B, etc.

### **Students with Disabilities:**

Students with disabilities should discuss accommodations with me.

### **Academic Misconduct:**

All students need to be familiar with the Student Conduct Code. You can find it in the “A to Z Index” on the UM home page. From this, please note that all students are expected to practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University.

### **Final Note:**

Announcements made in class are considered addenda to this syllabus.