

Differential Equations: Math 307 A and C - Spring 2015

Lecturer: Dr. Andrew D. Loveless **Email:** aloveles@math.washington.edu
Office: Padelford C-339 **Web page:** www.math.washington.edu/~aloveles

Office Hours: MW 12:00 - 2:00 pm, F 12:00 - 1:30 pm. You are welcome to drop by my office without an appointment during any of these times. I also will always come to my first lecture early (around 9am outside MGH 231) to answer questions.

Text: The official textbook is Elementary Differential Equations and Boundary Value Problems, 10th Ed. by William E. Boyce. A custom version containing only the chapters needed for MATH307 is available for purchase in the bookstore. If you plan to take Math 309, there is a hardbound text with the same title by William E. Boyce and Richard C. DiPrima which covers the material from both courses. Access to the textbook is required, as homework questions will be taken from the book. You are welcome to work from earlier editions of the book (e.g. 8th and 9th editions), but know that the onus is on you make sure you account for any differences between versions including any homework problems taken from the textbook.

Objectives: This course will introduce you to differential equations. We will focus on applications, namely setting up, solving, and interpreting differential equations. From time to time we will mention some of the underlying theory. There are three main topics that we will cover throughout the course, each for about three weeks:

- First order differential equations. Autonomous, separable, and linear equations which arise in physics (e. g. motion, mixing problems) and biology (population dynamics).
- Second order differential equations. Second order constant coefficient differential equations equations which come up in the study of mechanical and electrical vibrations.
- Laplace Transform. A technique which enables us to solve constant coefficient differential equations by converting them into an algebraic problem.

Grading: The weight for each part of the course is given below.

<u>Category</u>	<u>Weight</u>
Test Prep (Typically Fridays)	4
Homework (Due on Wednesdays)	10
Midterm 1 (Wed, April 22)	25
Midterm 2 (Wed, May 20)	25
Final Exam (See below)	36
<hr/> Total	<hr/> 100

Lecture: Lecture is on Monday, Wednesday, and Friday. You will be held responsible for all information that is discussed during lecture.

Homework: Homework assignments will be posted on the course website each week. Typically they will consist of somewhere from 10-20 problems from the book. A grader will give you a grade out of 10 for each assignment (typically two problems will be graded in detail for 3 points each and there will be an assessment of overall completeness worth 4 points). The primary goal of the homework is to practice and master the skills and concepts of the course! Then you will show your mastery of the material on the exams.

Exams: The midterms will be 50 minutes long and will be given at lecture. The first midterm will cover the first third of the course and the second midterm will cover the second third of the course. The Final Exam is cumulative.

MATH 307 A FINAL EXAM: Wednesday, June 10, 8:30am to 10:20am in MGH 231

MATH 307 C FINAL EXAM: Monday, June 8, 8:30am to 10:20am in SIG 225

Test Prep: There will be a small number of test prep exercises (probably 4). A test prep exercise will consist of 1 or 2 short problems that use skills needed to do well on the exams. I will give you 5-10 minutes to complete them on your own and you will hand it in. I will primarily grade on participation (only a very small amount of the grade will be based on correctness). I will drop your lowest test prep score. The intention is to give you a low stress situation to practice your understanding in an exam-like situation. In addition, these exercises give your instructor (me) some helpful information on how well students are understanding the material.

Calculators and notes: You will need a scientific calculator for Math 307. It must have trigonometric functions, like Sin and Cos, as well as logarithms and exponentials (ln and exp). **GRAPHING CALCULATORS ARE NOT ALLOWED** on quizzes and exams in Math 307. A graphing calculator is any device with a multiline display that has the ability to graph mathematical functions. A single, **hand-written** 8.5 x 11 inch sheet of notes is allowed during exams. You may write on both sides.

Make-Ups: *Late homework will not be accepted for any reason, if you are going to be absent, plan to turn in your homework in advance of the due date.* In case of observance of religious holidays or participation in university sponsored activities, arrangements must be made at least 1 week in advance for exams. You will be required to provide documentation for your absence. *Make-up exams will not be given.* If you miss an exam due to **unavoidable, compelling, and well-documented** circumstances, your final exam will be weighted more heavily.

Class Philosophy: There are two vital rules for success in my classroom.

1. THE HOMEWORK IS THE KEY: In mathematics, breakthroughs in learning rarely occur while reading the text or attending lecture. Mathematics is truly learned when you completely solve a problem AND understand the underlying concepts and tools so as to be able to apply them to related problems. The lecture, tutorial sessions, and office hours are valuable tools in guiding you towards learning and discovery, but ultimately the concepts and solutions must be absorbed, understood, and applied by you alone. Treat each problem as an exam question and ask yourself, "Can I answer this question without any help and do I understand the underlying principles that this problem conveys?" If your answer is no to either of these questions, then you need more studying and practice.

2. ASK FOR HELP: Most students will hit a wall at some point during the course. Some can't handle the large workload, while others find difficulty with specific concepts in the course. When these times arrive remember to ask for help. Come to me, ask your classmates for help, visit CLUE and/or visit the student counseling center. These are just a few of your options. Please, please, please find help earlier rather than later. You are all smart enough to do well in this course, the question is whether or not you are determined enough.

Resources:

- A link to the class website can be found at: <http://www.math.washington.edu/~aloveles/> You will find homework assignments, review sheets, grade information, a calendar, past exams, and many other helpful postings.

- The Center for Learning and Undergraduate Enrichment (CLUE) holds drop-in tutoring sessions every week-day evening in Mary Gates Hall Commons. See <http://depts.washington.edu/clue/> for more details.

- To request disability accommodation contact the Disability Services Office at least ten days in advance at: 206-543-6450/V, 206-543-6452/TTY, 206-685-7264(FAX), or dso@u.washington.edu.

- The Student Counseling Center provides academic skills workshop on a variety of topics including stress management test anxiety and time management to help you succeed at the University of Washington. If any of these is an issue for you, check out the schedule of workshops at <http://depts.washington.edu/scc/studyskills.html>.