

## Introductory Differential Equations

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Hello and welcome to autumn quarter introductory differential equations. I look forward to working with you.

### Course Objectives Plus a Little More

*all times are in Pacific time (Seattle time).*

In this course, we provide you with a "first look" at differential equations. You should leave this quarter with a sense of what they are, why they are important, how to solve a few, and how to apply the theory of differential equations to basic real world problems.

As a result, the focus is on solving problems. With the tools you will learn, you will solve problems that are a little more complicated than in previous quarters. Problems will be a little less straight forward and mathematical definitions will become more important. Story problems tend to be difficult for students. Keep this in mind.

The course is broken up in 3 phases:

- Phase 1: First order differential equations and an introduction to the topic: the modeling process, the basics of differential equations, solutions to differential equations, Euler's method and the numerical approach, exact solutions to certain differential equations, qualitative analysis, and applications.
- Phase 2: Second order differential equations: basics, constant coefficient systems, and applications to spring systems.
- Phase 3: Laplace Transforms: basics of Laplace transforms, solving initial value problems using the transform, Heaviside and delta functions, and convolutions

### Course Structure

The course is based on Heather Lee's lectures (you will see them on the canvas page) and the textbook *Introduction to Differential Equations by Boyce, DiPrima, and Meade*.

Every week there are lectures to watch and homework to complete. Homework is due weekly on Tuesday at 11:59 pm. I will assess your progress via 5 quizzes. There are two quizzes given for practice, which will be graded by completion. Quizzes will be administered on Fridays (but not every Friday) via Gradescope at 1:30 pm and must be submitted by 1:55 pm. I will be available during the quizzes via zoom. After the quiz (around 2pm) I will go over various material from the week.

You will also be invited to participate in a supplemental class on either Monday or Wednesday ( you'll receive a canvas inbox message ). The supplemental class will essentially be an office hour.

#### Grade Distribution

**THERE WILL BE NO CURVE THIS QUARTER.** Here is how the grade for this class will be broken down:

|                         |          |
|-------------------------|----------|
| Homework                | 20%      |
| Best 4 out of 5 Quizzes | 20% each |

**Guarantee: If you earn 65% of the total points you will earn at least a 2.0 GPA.**

#### Quizzes

For the first two weeks, there will be two practice quizzes. These two non-graded quizzes will be graded based on whether there was an honest attempt to solve the problem (that is, graded based on completion). The points for these quizzes will go towards your homework grade. The first of the five graded quizzes will be on the Friday of the third week. The remaining quizzes will be administered on the fifth, seventh, ninth, and final week of instruction.

The quizzes will be 20 minutes long and accessible on Gradescope at 1:30 pm. They will end at 1:50. You will need to submit the quizzes by 1:55 pm. If there is a problem with submitting you need to contact me immediately at the email above. Be sure to include a time stamp and your submission. **IF YOUR QUIZ IS NOT IN BY 1:55 YOU WILL LOSE POINTS ON THE QUIZ AND IF NOT IN BY 2:00 YOU WILL RECIEVE A ZERO FOR THE QUIZ.**

Each quiz will have two problems. You should spend about 10 minutes on each problem. I will provide a zoom link for Fridays. You are strongly encouraged to join the zoom class for the quiz. Regardless, I will be there to answers questions. Do not chat with others during the quiz. Do not use notes and do not use anything other than paper, pencil, calculator.

### **Homework**

Webassign homework is due Tuesday at 11:59 pm each week. Two practice quizzes will count towards the homework grade. No extensions will be given, but you may miss 10% of the total of homework points available for the quarter without penalty to your grade.

## **Policies**

### **Make-Up policy:**

No extensions will be granted for homework or quizzes to anyone. If you need to miss an exam due to unavoidable, compelling, and well-documented circumstances, contact me immediately. Do not wait until after the a quiz to reach out to me.

### **Academic Honesty**

We have removed the curve to reward everyone who puts in the work to succeed in this class. We removed the exams and replaced them with 5 quizzes to remove the pressure of high stakes testing. If you get 90% on your homework you will earn all the points for your homework, so you can make homework a learning opportunity. Your grade is based on homework and a few quizzes. Why did we do all of this? We want you to focus on learning.

I know that the temptation can be strong, but please don't cheat. There is so much to be gained by working through problems. There is so much to lose if you get caught cheating. Any cheating will be reported. If an answer you give appears to be suspicious, I reserve the right to question you orally about how you derived your answer.

### **Calculators**

Only scientific Calculators permitted on exams.

### **Religious Accommodations**

Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UWs policy, including more information about how to request an accommodation, is available at Religious Accommodations Policy:

<https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/>

Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request form:

<https://registrar.washington.edu/students/religious-accommodations-request/>

## **Required Material and Resources**

For this quarter you will need

- a textbook,
- a calculator,
- the internet,
- accounts in Canvas, Gradescope, Webassign, Zoom, and possibly Piazza,
- a computer or device for communicating and working in Zoom,
- the ability to upload your work onto Gradescope.

## TEXTBOOK

Our course will loosely follow *Introduction to Differential Equations by Boyce, Diprima, and Meade*. Since the homework will not come directly from this book, you are free to use older editions. **You can access the etext from our class canvas page.** To find it go to the home tab and it should be at the bottom of the page. Access is free for 10 days and then it will cost \$25. You pay the bookstore at [this link](#). After that you can no longer purchase the ebook.

## Canvas

This is where the content of your class resides. Think of Canvas as the central place for you to connect to this class. Links to everything you need will be here. Your grades will be there. If you need to contact me you can do this there (go to inbox). We are likely to use canvas discussion instead of Piazza.

## Webassign

This is how you will do your homework. See the homework section above. Be sure to log into UW Webassign. You can find a link to it on the homepage. **You will need to buy access (\$22.95) and have two weeks to comply.**

## Gradescope

Your quizzes will be conducted via Gradescope. There is a link on the homepage that details how to use Gradescope. If you have problems with uploading to Gradescope contact me immediately. I will be reasonable, but I need to know ASAP.

## Piazza

We will try canvas discussion and may move over to Piazza. Piazza is where you can ask and answer questions. Every week you are expected to post something to our Piazza form.

## Resources for Students with Disabilities:

The University of Washington is committed to providing access, equal opportunity and reasonable accommodation in its services, programs, activities, education and employment for individuals with disabilities. To request disability accommodation contact the Disability Services Office at least ten days in advance at: 206-543-6450/V, 206-543- 6452/TTY, or dso@uw.edu.