

MATH 207A: INTRODUCTION TO DIFFERENTIAL EQUATIONS

UNIVERSITY OF WASHINGTON, SUMMER 2024

Instructor: Sean Richardson (seanhr@uw.edu)

Teaching Assistant: Leo Zhang (leoyz@uw.edu)

Lecture: MWF 9:40 – 10:40 in WFS 201 and over Zoom at this link [↗](#) . Lectures will be recorded and available on Canvas under “Panopto Recordings”[↗](#) .

Sean’s Office Hours: At the following times at this Zoom link [↗](#) and by appointment.

- Fridays 11:00-12:00 in PDL C-543 and over Zoom.
- Wednesdays 3:00-4:00 only over Zoom. This will be rescheduled to Tuesday for weeks 1, 4, and 7.

Leo’s Office Hours: Mondays 12:00-2:00 in PDL C-8B and over Zoom at this link [↗](#) .

Course Description: Introduction to differential equations and methods for solving first and second order differential equations. Topics include the method of separation of variables, the method of integrating factors, solving homogeneous constant-coefficient 2nd order differential equations, some cases of non-homogeneous constant 2nd order differential equations, and solving differential equations with the Laplace transform. We will also cover slope fields and Euler’s approximation. All techniques covered will be accompanied with relevant applications such as population dynamics, mixing problems, and harmonic oscillators.

Prerequisites: Minimum grade of 2.0 in MATH 125. In particular, the most important topics to review are differentiation and integration.

Textbook: *Introduction to Differential Equations* by Boyce, DiPrima, and Meade. You can access the ebook from the class Canvas page. Access is free for 10 days, then it will cost \$26, which you pay via a link on your MyUW Accounts page. You must pay for the ebook before the end of the free access period. Alternatively, you can purchase a paper version in which case the older (and cheaper) editions *Elementary Differential Equations and Boundary Value Problems* or *Elementary Differential Equations* by the same authors will do.

Hybrid format: This course will be hybrid, meaning you can attend the class in person, but also can fully participate in the class from off-campus with the exception of exams. In particular, lectures will be recorded and available on Canvas in the “Panopto Recordings” page. You may also attend lectures live over Zoom, and office hours will be available over Zoom. See the “Zoom” page on Canvas for the schedule of all Zoom links. Exams will be taken on UW campus, but you may make arrangements to take an exam at an approved proctoring center by following the guidelines at this link [↗](#) .

Homework: You will have eight homework assignments throughout the term. To see when homework is due, see the attached course calendar or the Canvas calendar. Homework is submitted online through WebAssign and is due by 11:59pm. You will need to buy access (about \$25) and you need to pay by Sunday at the end of the first week of lecture. To access WebAssign, follow the steps at this link [↗](#) .

Exams: There will be two midterm exams and one final exam. All exams will be 60 minutes and taken in class. Alternatively, as this is a hybrid course you may make arrangements to take an exam at an approved proctoring center by following the guidelines at this link [↗](#) . The exam schedule is as follows.

- Midterm 1 will be July 10th 2024 (9:40-10:40).
- Midterm 2 will be July 31st 2024 (9:40-10:40).
- The final exam will be August 16th 2024 (9:40-10:40).

Grading: Your grade will be calculated as follows.

Homework:	15%
Midterm 1:	25%
Midterm 2:	25%
Final Exam:	35%

At the end of the quarter, your total raw score will be converted to a course grade between 0.0 and 4.0. If you achieve a raw score of at least 65%, you are guaranteed a passing grade of 2.0.

Resources for Students with Disabilities: Your experience in this class is important to me. It is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law. If you have already established accommodations with Disability Resources for Students (DRS), please activate your accommodations via myDRS so we can discuss how they will be implemented in this course. If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations (conditions include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), contact DRS directly to set up an Access Plan. DRS facilitates the interactive process that establishes reasonable accommodations. Contact DRS at disability.uw.edu .

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 UW's policy, including more information about how to request an accommodation, is available on the Religious Accommodations Policy page. Accommodations must be requested within the first two weeks of this course using the Religious Accommodations Request form. This form opens on June 8th and closes on June 28th at 5pm.

Academic Integrity: I take cheating very seriously and will report any instances to the department of Community Standards and Student Conduct and give zeroes accordingly. Cheating is defined as taking credit for someone else's work whether that be work by an online resource or a fellow student.

Important and Useful Links:

- The canvas page for this course [↗](#)
- Zoom link for class [↗](#)
- Zoom link for Sean's office hours [↗](#)
- Zoom link for Leo's office hours [↗](#)
- Zoom link for collaborative space for working on homework [↗](#) . This Zoom meeting is scheduled for 6-9pm on days homework is due, but will always be open for you to collaborate with peers.
- Guidelines for taking exams at an approved proctoring center [↗](#) .
- Archives of past exams for Midterm 1 [↗](#) , Midterm 2 [↗](#) , and the Final [↗](#) .
- Math 207 student page [↗](#) . This page contains instructions for signing up for Webassign, instructions for getting the textbook, and exams from previous courses.
- Thomas Carr's video lectures [↗](#) . This YouTube playlist contains high quality recorded lectures from a previous year of Math 207. This is the best place to go to get a different explanation of topics in lecture, and problems similar to many homework problems.
- Religious accommodations request [↗](#)
- Contact DRS [↗](#)

Course Calendar:

	Date	Items	Topics Covered
Week 1	Monday 6/17		- What is a differential equation (DE)?
	Friday 6/21		- Separable differential equations
Week 2	Monday 6/24		- Modeling with differential equations
	Wednesday 6/26	HW 1 due	- Applications of separable differential equations
	Friday 6/28		- Slope fields and equilibrium analysis
Week 3	Monday 7/01	HW 2 due	- Method of integrating factors
	Wednesday 7/03		- Applications of integrating factors
	Friday 7/05		- Euler's method
Week 4	Monday 7/08	HW 3 due	- Introduction to 2nd order differential equations
	Wednesday 7/10	Midterm 1	- Complex numbers review
	Friday 7/12		
Week 5	Monday 7/15		- 2nd order homogeneous constant coefficient DE's
	Wednesday 7/17	HW 4 due	(distinct roots and repeated roots)
	Friday 7/19		- Applications of 2nd order DE's
Week 6	Monday 7/22	HW 5 due	- Non-homogeneous 2nd order DE's
	Wednesday 7/24		- Applications of non-homogeneous 2nd order DE's
	Friday 7/26		
Week 7	Monday 7/29	HW 6 due	- Introduction to Laplace Transform
	Wednesday 7/31	Midterm 2	
	Friday 8/02		
Week 8	Monday 8/05		- Inverse Laplace Transform
	Wednesday 8/07	HW 7 due	- Solving DE's with Laplace transform
	Friday 8/09		
Week 9	Monday 8/12	HW 8 due	- Discontinuous forcing functions, dirac delta
	Wednesday 8/14		
	Friday 8/16	Final exam	