

**MATH 340: Introduction to Ordinary Differential Equations
Summer 2024**

Course: MATH 340 (4 credits)
Asynchronous
6/10/2024 – 8/2/2024

Instructor: Linley Bosse
Email: linley.bosse@colostate.edu
Summer Math Department Coordinator: Dr. Phil Kopel

Office Hours: Office hours will be held online and will flex week to week - I will post a link to access and date and times for the upcoming week Sunday evenings. You are also welcome email me to schedule office hours by appointment.

Prerequisites: MATH 255 or MATH 261

Description: First and second order equations, Laplace transforms, linear algebra, eigenvalues, first order systems of equations, numerical techniques.

Textbook: (optional) *Differential Equations with Boundary Value Problems, 2nd Edition* by Polking, Boggess, & Arnold

Important University Dates: June 17, 2024 – Last day to add
June 17, 2024 – Last day to drop
June 18, 2024 - July 23, 2024 - Window to withdraw from course
June 19, 2024 – Juneteenth Holiday - No class (No lecture posted)
July 4, 2024 – Independence Day – No class (No lecture posted)

Important Course Dates: June 28, 2024 - Midterm 1
July 5, 2024 - No class (No lecture posted)
July 17, 2024 - Midterm 2
August 2, 2024 - Final exam

Course Materials: All course materials (lectures, notes, HW, exams, Office Hours) will be accessed through Canvas. If you cannot find something please reach out ASAP!

Grade Breakdown: WeBWork (lowest score dropped) - 25%
Written Homework (lowest score dropped) - 25%
Midterm 1 - 15%

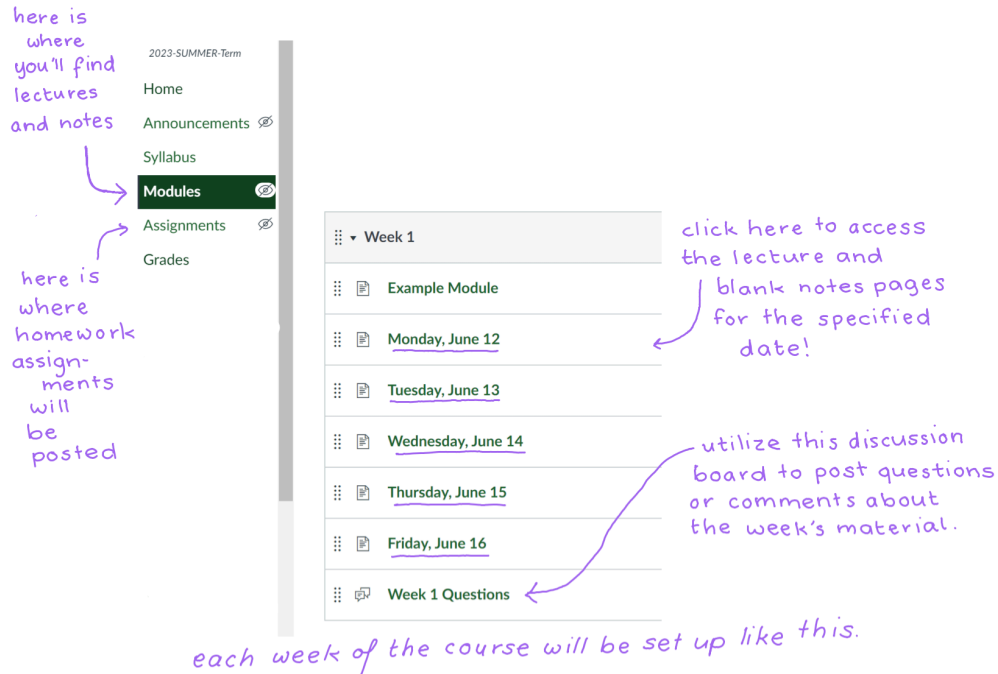
	Midterm 2 - 15%
	Final - 20%
Grading Scale:	A \geq 90%
	B 80 - 89%
	C 70 - 79%
	D 60 - 69%
	F < 60%

Pacing Disclaimer: Given the time frame of the summer semester, this course will be fast paced by necessity and it is important that you watch class every day and stay on top of the material. If you find yourself falling behind, please talk to me or seek out other resources as soon as you can rather than later!

Course/Canvas Layout: This course will utilize two primary pages on canvas; the *Modules* page and the *Assignments* page.

Modules: Lectures will be posted on the *Modules* page of Canvas. Each week of material will be under a title of "Week X - Summer 2024 Session 2". At the bottom of each week of material will be a Discussion Page, titled "Week X Questions". Here is where you can post questions or comments about any of the lectures and notes from that week, and respond (courteously and compassionately) to the questions of your peers.

Assignments: All homework and assessment materials will be posted to the *Assignments* page in Canvas, titled "Homework X" or "Assessment X". You will submit all of these assignments virtually through Canvas via these pages. Further details about assignments are given on the next page.



Homework:

Math is not a spectator sport! You must be willing to get your hands dirty, make mistakes, and then learn from your mistakes. To give you an opportunity to practice, I will assign homework weekly. Homework will consist of a Written component and a WebWork component. Homework will be assigned and submitted through Canvas or WebWork.

All homework for the week will be assigned one week ahead of time and due the following Thursday, but it is highly recommended that you complete the homework throughout the week as we learn the material. Late homework will not be accepted.

Your lowest Written and WeBWork assignment score will be dropped.

Assessments:

There will be two Midterms (6/28 and 7/17) and a Final Assessment (8/2).

****Important Note****

You have no more than one week after a homework or exam has been returned to you to have your score altered due to a recording error or grading mistake. Please take prompt responsibility for ensuring your grades are properly recorded in Canvas. The last day you have to discuss grading issues with me is Friday, August 2nd, the last regular day of class. *After Friday, August 2nd, I will be unavailable to discuss the course.* This makes it particularly important that you bring up any grading concerns with me before or on this day!

Course Outline:

- First-Order ODEs
 - Qualitative analysis
 - Numerical analysis
 - Separable, linear, and exact equations
 - Applications
- Second-order ODEs
 - Linear equations
 - Constant and undetermined coefficients
 - Laplace transformation
- Linear Algebra
 - Matrices, vectors, linear transformations
 - Characteristics of matrices (bases, rank, etc.)
 - Eigenvalues and eigenvectors
- Systems of ODEs
 - Qualitative analysis via nullclines
 - Linear/matrix systems
 - Nonlinear systems
 - Bifurcations

Calendar:

Week	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1 (6/10-14)	<i>Lecture Posted</i>	<i>Lecture Posted</i>	<i>Lecture Posted</i>	<i>Lecture Posted</i> HW 1 Assigned	<i>Lecture Posted</i>
Week 2 (6/17-21)	<i>Lecture Posted</i>	<i>Lecture Posted</i>	Juneteenth – No Lecture Posted	<i>Lecture Posted</i> HW 2 Assigned HW 1 Due	<i>Lecture Posted</i>
Week 3 (6/24-28)	<i>Lecture Posted</i>	<i>Lecture Posted</i>	<i>Lecture Posted</i>	<i>Lecture Posted</i> HW 3 Assigned HW 2 Due	Midterm 1
Week 4 (7/1-5)	<i>Lecture Posted</i>	<i>Lecture Posted</i>	<i>Lecture Posted</i> HW 4 Assigned HW 3 Due	July 4th – No Lecture Posted	No Lecture Posted

Week 5 (7/8-12)	<i>Lecture Posted</i>	<i>Lecture Posted</i>	<i>Lecture Posted</i>	<i>Lecture Posted</i> HW 5 Assigned HW 4 Due	<i>Lecture Posted</i>
Week 6 (7/15-19)	<i>Lecture Posted</i>	<i>Review Day</i>	Midterm 2	<i>Lecture Posted</i> HW 6 Assigned HW 5 Due	<i>Lecture Posted</i>
Week 7 (7/22-26)	<i>Lecture Posted</i>	<i>Lecture Posted</i>	<i>Lecture Posted</i>	<i>Lecture Posted</i> HW 7 Assigned HW 6 Due	<i>Lecture Posted</i>
Week 8 (7/29-8/2)	<i>Lecture Posted</i>	<i>Lecture Posted</i>	<i>Lecture Posted</i>	<i>Review Day</i> HW 7 Due	Final Exam

Tutoring Resource:

There are a number of resources available to help you succeed. Some of these include:

- **The Calculus Center** located in TILT, on the 2nd floor, offers drop-in service for tutoring 10:00 am to 2:00 pm, Monday - Friday. You are welcome to drop in during any hours a MATH 340 instructor is listed for guaranteed help, otherwise there may be additional tutors teaching other courses that can help you at other times listed.
- **Private Tutors** TILT offers a list of private tutors [here](#).
- **By Appointment:** If you are unable to utilize the above resources nor my office hours given your schedule, please email me and we can arrange an alternative time to set up a help session.

Policies:

The Department of Mathematics has a set of policies which cover topics ranging from cell phones to alternate exams. These are available at this [link](#) and it is your responsibility to read them. The university also has a page at this [link](#) that provides policies relevant to all courses and resources to help with various challenges you may encounter. I highlight some specific policies and resources here.

Universal Design for Learning/Accommodation of Needs:

CSU is committed to the principle of universal learning. This means that our classrooms, our virtual spaces, our practices, and our interactions should be as inclusive as possible. Mutual respect, civility, and the ability to listen and observe others carefully are crucial to universal learning.

If you are a student who will need accommodations in this class, please contact me to discuss your individual needs. Any accommodation must be discussed in a timely manner. A verifying memo from The Student Disability Center (SDC) may be required before any accommodation is provided. SDC website:

<https://disabilitycenter.colostate.edu/>

Equity and Inclusion Statement:

Colorado State University embraces the diversity of students, faculty, and staff, honors the inherent dignity of each individual, and welcomes their unique perspectives, behaviors, and worldviews. In this course, people of all races, religions, national origins, sexual orientations, ethnicities, genders and gender identities, cognitive, physical, and behavioral abilities, socioeconomic backgrounds, regions, immigrant statuses, military or veteran statuses, size and/or shapes are strongly encouraged to share their rich array of perspectives and experiences. Course content and campus discussions are intended to heighten your awareness to each other's individual and intersecting identities

Academic Integrity:

Courses in the Mathematics Department adhere to the Academic Integrity Policy of the Colorado State University General Catalog and the Student Conduct Code (which can be found in section 1.6 of the course catalog).

By handing in homework and exams you certify that it is your own work. You are encouraged to discuss homework solution strategies with fellow students but the final write-up must be your own. Misrepresenting someone else's work as your own (plagiarism; this includes submitting work from a Solutions Manual or an on-line homework web site as your own) or possessing/using unauthorized reference information in any form that could be helpful while taking an exam are some examples of cheating. Students judged to have engaged in cheating may be assigned a reduced or failing grade for the assignment or the course and may be referred to the Office of Conflict Resolution & Student Conduct Services for additional disciplinary action.

Mental Health and Wellness:

CSU is a community that cares. You are not alone. CSU Health Network Counseling Services has trained professionals who can help. Your student fees provide access to a wide range of support services.

Call Counseling Services at (970) 491-6053, and they will work together with you to find out which services are right for you.

- [CSU counseling services](#)
- [Student mental health and well-being resources](#)

If you are concerned about a friend or peer, use Tell Someone by calling (970) 491-1350 or visiting <https://supportandsafety.colostate.edu/tell-someone/> to share your concerns with a professional who can discreetly connect the distressed individual with the proper resources. Rams Take Care of Rams. Reach out and ask for help if you or someone you know is having a difficult time.

Changes to the syllabus

Some of the information on the syllabus and pacing guide, such as the exact order of topics covered, is tentative and potentially subject to change. Changes to the grading scheme are very unlikely to occur and, if this becomes necessary due to circumstances outside of our control, will work out in your favor.