

## MTH 255H: Vector calculus II Spring 2025

**Class Hours:** WF 12pm – 1:50pm  
**Credit Hours:** 3 credits  
**Classroom:** STAG 111  
**Instructor:** Sergio Zamora

**Email:** [zamorabs@oregonstate.edu](mailto:zamorabs@oregonstate.edu)  
**Office:** Kidder Hall 260  
**Office Hours:** MWF 11am–12pm and by appointment

### 1 Prerequisites:

MTH254 or MTH254H with C- or better.

### 2 Textbook:

Calculus Volume 3 by Edwin J. Herman and Gilbert Strang. OpenStax.  
<https://openstax.org/details/books/calculus-volume-3>

### 3 Online Homework System:

Macmillan Learning's Achieve. Requires purchase through the OSU Beaver Store.  
More information will be posted in an announcement on Canvas.

### 4 Course Evaluation:

Online Homework (10%) + Quizzes (40%) + Midterm (25%) + Final (25%) = Total (100%).  
60% guarantees a D, 70% guarantees a C-, 80% guarantees a B-, 90% guarantees an A-.

- HW will be assigned each Wednesday, with deadline the following Wednesday.
- Quizzes will be held each Wednesday during class starting on January 14.
- The Midterm Exam will be held on February 11 during class.

### 5 Late HW and Make-up Quizzes:

To request a HW extension or a Make-up Quiz, please contact me as early as possible. In your request, include both the reason for your request, and any supporting documentation (if applicable). Requests made after the due date may not be granted unless there are exceptional circumstances.

### 6 Course Description:

Brief review of vector functions, space curves, gradients, and directional derivatives. Introduction to vector analysis: vector fields, divergence, curl, line integrals, surface integrals, conservative fields, and the theorems of Gauss and Stokes with applications to force, work, mass, and charge.

### 7 Measurable Student Learning Outcomes:

A successful student in MTH 255H will be able to:

- Use scalar and vector fields to model a variety of physical situations, be able to draw field strength diagrams, and be able to infer qualitative properties of divergence and curl from the diagrams.
- Utilize a geometric understanding of vector fields, and in particular, conservative vector fields, including their relationship to the gradient and to level sets.
- Evaluate the divergence and curl of vector fields and be able to interpret the physical meaning of these quantities, including their relationship to circulation and flux.

- Set up and evaluate line and surface integrals and be able to use them to find physical quantities such as mass, charge, work, flux, and center of mass.
- State the integral theorems of Green, Gauss, and Stokes and be able to develop a geometric understanding of these theorems.

## 8 Course Content:

The following topics will be covered:

- Review of key concepts from MTH254
- Change of variables
- Line integrals of scalar functions
- Surface integrals of scalar functions
- Vector fields
- Curl and Divergence
- Conservative vector fields
- Line integrals of vector fields
- Surface integrals of vector fields
- Green's Theorem
- Stokes' Theorem
- Divergence Theorem

## 9 AI policy:

Generative AI (genAI) tools such as ChatGPT are permitted in this course for specific uses.

**You should be able to reproduce any submitted work without genAI.  
Violation of this policy is a breach in Academic Misconduct and is cheating.**

You should work through all problems in this course on your own, without the assistance of genAI. You will be required to work through problems on your own during exams where you will not have access to genAI tools. Set yourself up for success by engaging with the activities with only the resources provided to you throughout the course. If you are struggling with a problem, seek help, preferably from a member of the teaching team, classmate, peer, or an [OSU tutoring center](#). Science is inherently a social and collaborative effort among humans, where individual proficiency is also needed for full engagement.

Use genAI responsibly and encourage others to do the same. Using genAI ethically and responsibly includes considering unintended consequences of your usage. Some points to consider to use genAI responsibly:

- GenAI discourages, and in some cases hurts (see [Gerlich+25](#) and [Lee+25](#)), the development of critical-thinking and sensemaking skills, which are extremely important to develop and strengthen early in your education.
- There are a variety of ethical concerns surrounding genAI. [This website](#) has a list of common concerns and ethical challenges associated with genAI. These include bias and discrimination, privacy concerns, and transparency.
- GenAI comes with a high environmental cost. GenAI data centers use a large amount of energy and water. [This website](#) lists some of these concerns in more detail.
- GenAI is not always correct, and the output should always be questioned. GenAI can often give gibberish that sounds sophisticated enough that it fools non-mathematicians but is clearly genAI to an expert. You need to be diligent about checking and verifying the output, particularly if you are using it to help you understand math. The sensemaking tools we have been honing up will help your ability to check the output.

Permitted uses of genAI:

- Generate practice problems when studying
- Asking for an alternate explanation of a concept you did not understand in class
- Asking for feedback on an explanation you wrote
- Looking up applications of abstract concepts learned in class

Not prohibited, but not recommended uses of genAI:

- Generate study materials, including note sheets, concept maps, generalized study guides, etc.
- Making a formula sheet
- Asking for a solution to a homework question to check your work

Prohibited uses of genAI:

- Asking for an answer / solution to a HW problem you have not first attempted and sought help with through appropriate channels (e.g. textbook, Canvas discussions, office hours, asking classmates)

Any use of genAI needs to be [properly cited](#). Do not upload course materials to public tools. Uploading course materials developed by OSU Faculty to public tools is considered intellectual property infringement. By default, many genAI tools that are available to you are using the content you provide to train their models. Here are some instructions on how to opt out, starting at the indicated genAI home pages:

- [ChatGPT](#): Click on your account icon, going to Settings, then Data Controls, and turning off the setting called “Improve this model for everyone”.
- Microsoft Copilot: Click on your account icon, click on your name, then Privacy, then turn off “Model training on text”.
- Google’s Gemini: Click on the Settings icon in the lower left corner, then Activity, then click “Turn Off” next to the “Gemini Apps Activity”.

If you have questions about genAI use on a particular assignment or assessment, talk to your instructor prior to beginning the task. If you have any questions about this policy, ask your instructor.

## **10 Students with Disabilities:**

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS should contact me prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately. Further information is available on the DAS website [ds.oregonstate.edu](https://ds.oregonstate.edu).

## **11 Student Conduct Code:**

Students are expected to follow the Oregon State University’s Student Conduct Code found at [beav.es/codeofconduct](https://beav.es/codeofconduct).

## **12 Reach Out for Success:**

University students encounter setbacks from time to time. If you encounter difficulties and need assistance, it’s important to reach out. Consider discussing the situation with an instructor or academic advisor. Learn about resources that assist with wellness and academic success at the Reach Out For Success website [counseling.oregonstate.edu/reach-out](https://counseling.oregonstate.edu/reach-out). If you are in immediate crisis, please contact the Crisis Text Line by texting OREGON to 741-741 or call the National Suicide Prevention Lifeline at 1-800-273-TALK (8255).

## **13 Student Bill of Rights:**

OSU has twelve established student rights. More information can be found at the website [asosu.oregonstate.edu/advocacy/rights](https://asosu.oregonstate.edu/advocacy/rights).

## **14 Academic Calendar:**

All students are subject to all deadlines as stated in the Academic Calendar: [registrar.oregonstate.edu/osu-academic-calendar](https://registrar.oregonstate.edu/osu-academic-calendar).

## **15 Honors College Equity, Diversity, and Inclusion Statement:**

The Honors College and its members strive to create an equitable and inclusive community in which all members are welcome, heard, and treated with respect. We uphold these values and take the opportunity to learn from each other. Our greatest strengths and most innovative ideas come from disagreements and collaborations among people with diverse perspectives, lived experiences, and expertise.