MATH 231 – Multivariable Calculus (Spring 2025)

Instructor: Kevin Woods. Call me Kevin! (he/him)

Contacting me: Kevin.Woods@oberlin.edu or 443-695-1681 (mobile). Email is better for involved or less important questions; texting is better for quick, time-sensitive questions.

Section 1 Class: MWF 10-10:50am, King 243.
Section 2 Class: MWF 11-11:50am, King 243.

Google Drive: I will post assignments and other material in the course Google Drive folder. I recommend bookmarking this link (it is available from blackboard, if you need).

Problem Sessions: Come individually, come in groups, come with questions, come to get started on the homework with other students around. Your choice! Showing up to this is a great way to find other students to collaborate with. Either I or our dedicated tutor, Susanne Goldstein will be there to facilitate group work and give help:
- Sundays 7:30-9:30pm, King 337 (with Susanne)
- Tuesdays 7:30-9:30pm, King 337 (with Susanne)
- Wednesdays 1:30-3:20pm, King 203 (Math library, with me)

Office Hours:
- Tuesdays 2:30-4:30pm, King 203 (mainly for my other class, but you are welcome to come)
- If these times don't work, you can make an appointment via email.

Required Textbook:
- *Vector Calculus*, Susan Colley and Santiago Cañez, **5th edition**. The edition number is important, because your homework assignments will be taken from here.
- We will cover almost all of Chapters 1-6.
- I've posted the first chapter, which will last us two weeks, on our google drive.

Prerequisites: Some comfort with the Calculus I/II curriculum. You don't need course credit for them, and you don't need to remember everything immediately. We're kind of starting from the beginning, so there will be time to remind yourself of derivative rules, etc. This class does move faster than those probably did.

Learning Goals:
At the end of this course, students should be able to:
- Have a conceptual understanding of the ideas and methods of Multivariable Calculus (including vectors, limits, differentiation, integration, optimization, curves, vector fields, and line integrals).
- Struggle with mathematical concepts, practice persistence, and develop confidence in the face of difficulties.
- Model situations and solve problems using the language and techniques from Multivariable Calculus.
- Communicate mathematical ideas in writing.
- Have experience working with other students on mathematics (this one is up to you to work on).

Assignments and Grades:
- Your focus should be on **growth**, but grades are a fact of college life. **If I can see that you are working hard and seeking support, you will pass this class.** If you find yourself preoccupied with grades, consider taking it P/NP.
- Each Friday, I will give you a schedule of the specific assignments for the next week. These will also be posted in our google folder.
- Note that almost every type of assignment has some sort of forgiveness (e.g., dropping some number of them). Life happens: you get busy, you get sick, you self-isolate, you oversleep, you struggle in the class but slowly improve, and I want to acknowledge that.

- Reading Questions (15%, lowest three dropped).
  - I don't want to come to class each day and tell you what the book already says. Because of this, you need to read the book beforehand; we can have better discussions when we're on the same page about the material. To encourage this, you must answer a few questions before each class.
  - You must answer these by **9am the day of class**. These will not be graded for correctness, only that you made a legitimate attempt at them. These will also be helpful to me to see what I need to emphasize in class.
  - To submit answers, read the questions on the weekly schedule of assignments, and then submit your answers on this google form.
  - Since the point is to force you to read before class, I do not accept late submissions (but each one is worth a very small percentage of your grade, and I will drop three).
- Homework (25%, lowest two dropped).
  - The best way to learn the tools and concepts in this course is to practice! This is also an opportunity to work on writing careful, clear proofs and explanations. Good mathematics is articulate mathematics! Explain things carefully and in complete sentences. Imagine that another student in the class who hasn't done this problem yet will read your solution: they should be able to understand it without having to ask you questions.
  - Homework will be assigned each week and generally due Wednesdays at 10pm, submitted via gradescope.
  - Late Work: I will give you until Thursday 10pm for problem sets, if you ask in advance and don't make a habit of it. After that, late work is generally not accepted, because it needs to go to the graders. I drop two problem sets because I know that everyone has bad days or weeks, so it is perfectly ok to simply skip that week.
  - Honor Code: I encourage you to work together on the homework sets. Your solutions must be in your own words, however. Work on the problem together, and then go back home and write up your solution. You should never go looking for the solution to a specific problem: for example, **don't read someone else's solution, search the internet or a book, or ask reddit/AI/etc**.
- Two midterms and a final (60% total, lowest score dropped)
  - Each of these will have an in-class and a take-home portion.
  - The in-class midterms are tentatively Wednesday, March 5 and Wednesday, April 16. The final is Wednesday May 14, 7-9pm (10am section) or Thursday, May 15, 7-9pm (11am section).
  - Honor Code: You must work on them alone. The take-home will be open book, and the in-class will be closed book, but you are allowed a page of notes. More detailed instructions will follow.
  - Late Work Policy: Only in rare (emergency) circumstances will late exams be accepted.
  - I want you to succeed, and everybody has bad days or weeks. **I'll drop the lowest exam score, as long as you put in a good-faith effort on all of them**.

Support:

- You belong at Oberlin and you belong in this class. People arrive here with different experiences and backgrounds in mathematics and statistics. Put in the work, seek out support, and focus on self-improvement, and I promise you that **your mathematical skills will grow**. The rest of us are here to help, including:
- Me! Come by office hours, any time.
- The dedicated tutor, Susanne! See the problem session times above.
- Your peers! Working with other students helps everyone improve.
- **Yourself!** Your skills will improve best if you come at this with a growth mindset: embrace the challenge of this class, persist through difficulty, be inspired (not threatened) by the success of others, seek out support, communicate and advocate for yourself.
- If you have a disability of any sort that may affect your performance in this class, please consult with me and with the Office for Disability and Access. I am committed to meeting the needs of all students in my class.
- You can often get a free, individual peer tutor from the AARC.
- **I want you to succeed, and I want to help you succeed.** Please let me know how I can help!