

CALCULUS III
MATHEMATICS UN1201 (MATHV1201)
SECTIONS 002, 003
FALL 2023

Instructor: Gyujin Oh (gyujinoh@math.columbia.edu), pronouns: he/him/his.

Webpage: <https://math.columbia.edu/~gyujinoh/~Fall2023.html>, and Courseworks.

Time and location:

- Section 002: MW 8:40-9:55AM, at 203 Mathematics.
- Section 003: MW 10:10-11:25AM, at 203 Mathematics.

Office hours: Wednesdays 1-4PM, at 517 Mathematics, and Fridays 9-10AM, on Zoom.

Teaching assistants: TBA.

Textbook: *Calculus: Early Transcendentals*, 9th Edition, by James Stewart.

It is not mandatory but strongly recommended to read the textbook, as the course will closely follow it. On the other hand, I will post the lecture notes I wrote. It is indeed very helpful to read the textbook for a better understanding of the material. On the other hand, the same content can be found in an older edition of the textbook. If you choose to use an older version of the textbook, be mindful that **the section/exercise numbers are often different**.

Prerequisites: Calculus I or equivalent. You can find more information on the math department website on the Calculus sequence.

What this course is about: This course marks the beginning of **multivariable calculus**. The following are the corresponding sections in the textbook that we will cover.

- Vectors and the geometry of space (Section 10.5 and Chapter 12)
- Vector functions (Chapter 13)
- Functions of several variables and partial derivatives (Chapter 14)

There are many other multivariable calculus courses that can serve as an alternative to this course. Depending on what you want, you may consider taking one of the following courses instead.

- MATH UN1205 (Accelerated Multivariable Calculus)
This is Calculus III + IV taught in one semester, covering Chapters 12–16 of Stewart.
- MATH UN1207 (Honors Math A)
This is proof-based, and combines Calculus and Linear Algebra.
- APMA 2000 (Multivariable Calculus)
This is for SEAS students.

Grading: There are four main components for the grade, **homework, two midterms, and the final**. You can also earn up to 10% of the full grade as a supplement¹ for your grade, by participating in supplementary activities (Supplementary activities do not mean the full grade is 110%! The full grade is still 100%).

The default weights are as follows.

- Homework, 25%
- Midterm 1, 20%
- Midterm 2, 25%
- Final, 30%

Supplementary activities have the following weights.

- Weekly feedback surveys, 3%
- Extra assignment, 7%

Although attendance is not part of the grade, per University policy, **students are expected to attend all classes**.

Alternative grading scheme: You can configure your own alternative grading scheme for the major grading components. Your final grade will be the highest of the two (one using the default grading scheme, one using your own alternative grading scheme). **Please let me know by Wednesday, September 27**. Your grading scheme should satisfy the following conditions.

- The sum of the weights for the main four grading components should be 100%.
- The weight for Homework should be in between 10% and 30%.
- The weight for Midterm 1 should be in between 10% and 25%.
- The weight for Midterm 2 should be in between 15% and 30%.
- The weight for Final should be in between 20% and 45%.

Homework: Most of the time, Homework will be out on every Wednesday, except exam weeks, and due the following Wednesday by 11:59PM. Exceptions are during the Thanksgiving week and the last week of the semester. There will be 11 homework assignments. Each homework assignment is worth 1/9 of the total homework grade, so you can miss up to two problem sets and still obtain a full grade on homework.

Please submit your homework on Gradescope, as a pdf file if possible, either typed or handwritten clearly and legibly. You are encouraged to collaborate on homework, but you must write up your own solutions in your words. Please cite any references used.

Except in extraordinary circumstances, late homework will not be accepted.

¹This means you can bump up your grade by at most 10% using this opportunity. For example, if you've got 65% from the main components, and you've got the full 10% from the supplementary activities, then your final grade is 75%. This does not mean that the max is 110%; if you've got 95% from the main components and 10% from the supplementary activities, your grade is 100%, not 105%.

Tests: There will be two in-class midterms (75 minutes) and a final exam (170 minutes). The (projected) dates are as follows.

- Midterm 1: Oct 4 (Wed), in-class.
- Midterm 2: Nov 8 (Wed), in-class.
- Projected Final Exam Date (To be confirmed in November)
 - Section 002 (MW 8:40-9:55AM): Dec 15 (Fri), 9AM-Noon.
 - Section 003 (MW 10:10-11:25AM): Dec 20 (Wed), 9AM-Noon.

If you think you cannot make one of the two in-class midterms, make-up exams may be arranged within 2 days of the originally scheduled dates. Please let me know as soon as possible. Unlike midterms, **the Final exam cannot be moved** at the instructor's discretion. If you have foreseeable difficulty in accommodating the current schedule of the Finals, please consult your advisor.

You may bring your own formula sheet during the exams. For the two midterms, the formula sheet should be no longer than two (2) sides of a single A4 paper. For the final, the formula sheets should be no longer than six (6) sides. **No electronic device (e.g. calculators) can be used during the exam.**

Supplementary activities

- **Weekly feedback surveys**

There will be a short survey posted every week regarding the past week's course. I will ask questions like "was X confusing for you?" etc. You can get up to 3% of the total grade as a bonus if you participate in the surveys. You will get the full bonus 3% if you participate in 6 or more surveys.

- **Extra assignment - Really, how is calculus used?**

You can choose to work on this extra assignment about how to use calculus (in mathematics, science, engineering, economics, etc.). After Midterm 2, I will post a list of problems you can choose for the extra assignment. The problems will be quite different from the regular homework assignments. For example, many problems will have several sub-problems to build up for a conclusion. Some problems may even ask you to write a short essay!

Students, if they wish, will then **choose one problem of their interest to work on.** This extra assignment will be **due 12/11 (Mon)**. The extra assignment can make up to 7% of the total grade as a bonus (namely, not affecting the main four grading components).

Feel free to suggest the topics of your interest! As a mathematician, I certainly do not know all the applications of calculus in other disciplines. Please email me if you are interested. We can talk about what might be of interest to you over the semester.

Accessibility and accommodations: Your success in this class is very important. We all learn differently. If there are aspects of this course that prevent you from learning or exclude you, please let me know as soon as possible. We can develop strategies to meet both your needs and the requirements of the course.

If you think you might need official accommodations, such as extended time on exams, I encourage you to contact the Office of Disability Services (Columbia) or CARDS (Barnard) for a confidential discussion. Once you register with them, they can provide you with an accommodation letter, which will allow you to receive official accommodations.

Staying well: Math, and college, can be hard. If you are facing challenges related to your physical or mental health, or any sort of difficulties, you are encouraged to contact your advising dean and/or the Student Health Service. If you feel comfortable doing so, please do not hesitate to get in touch with me to discuss ways we can put you in the best possible position to succeed. If you're finding yourself overwhelmed but don't get help, then the tide may very well sweep you away and leave you completely lost!

Inclusivity: We are part of a learning community and must treat one another with respect at all times. This is especially important with regard to race, religion, nationality, sexual orientation, gender, disability, age, size, immigration status, parental status, and any other aspect of identity. I am committed to ensuring that this class is a supportive, inclusive, and safe environment for all students, and that all students are treated with dignity and respect. See also the Columbia College Notice of Non-Discrimination.