**CALCULUS III**
**MATHEMATICS UN1201 (MATHV1201)**
**SECTIONS 005, 006**
**FALL 2024**

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

**Head TA**: Taeseok Lee (taeseok.lee@columbia.edu). For any questions, arrangements, or concerns about the course in general, please first contact the Head TA.

**Webpage**: https://math.columbia.edu/∼gyujinoh/∼Fall2024.html, and Courseworks.
All major course materials will be posted on both websites.

**Time and location**:

- Section 005: TR 11;40AM-12:55PM, at 203 Mathematics.
- Section 006: MW 1:10-2:25PM, at 207 Mathematics.

**Instructor office hours**:
Tuesdays and Thursdays 10-11AM (in-person, at 517 Mathematics); Fridays 9-10AM (Zoom).

**Teaching assistants**:

- Taeseok Lee (taeseok.lee@columbia.edu; graduate TA, Head TA)
- Chuwen Wang (cw3091@columbia.edu; graduate TA)
- Raymond Chen (sc5385@columbia.edu)
- Polina Mira Goldberg (pmg2147@columbia.edu)
- Fatih Uysal (fu2137@columbia.edu)

**Textbook**: *Calculus: Early Transcendentals*, 9$^{\text{th}}$ 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 may also earn up to additional 11% of the full grade by participating in supplementary activities.

The default weights are as follows.

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

Supplementary activties have the following weights.

- Weekly feedback surveys, 3%
- Optional homework assignments, 4%
- Individual project, 4%

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

The letter grade will be decided based on the sum of everything (Homework + Midterms + Final + Supplementary activities), maxed out at 100%, and will not be curved. **The only exception is A+**, which I will decide in a relative fashion based on the sum of everything (out of 111%).

**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 the Head TA (Zongrui Yang, zy2417@columbia.edu) know by Friday, 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 Tuesday, except exam weeks, and due on the following Tuesday by 11:59PM. 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.**

**Tests:** There will be two in-class midterms (75 minutes) and a final exam (170 minutes). The following (projected) exam dates may also be found in SSOL.

- Midterm 1: Oct 1 (Tue), in-class.
- Midterm 2: Oct 31 (Thu), in-class.
- Projected Final Exam Date (To be confirmed in November)
  - Section 005 (TR 11:40AM-12:55PM): Dec 19 (Thu), 4:10-7PM.
  - Section 006 (TR 1:10-2:25PM): Dec 17 (Tue), 1:10-4PM.

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, and this includes taking the other section's Final exam. If you have foreseeable difficulty in accommodating the current schedule of the Finals, please consult with your advising dean/advisor/etc. first before reaching out to me.

For example, I will **NOT** accommodate any Final exam date change request based on the following reasons:

- anything related to a personal travel;
- having another exam right before/after the Final exam;
- having several deadlines on the day of the Final exam.

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 about the past week's course. I will ask questions like "was X confusing to 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.
- **Optional homework assignments**
  There will be 2 optional homework assignments in addition to the regular weekly ones, which will contain a little more adventurous problems.
- **Individual project**
  After Midterm 2, I will post a list of problems you can choose for the individual project. The problems will be quite different from the regular homework assignments. Some problems will have several sub-problems to build up for a conclusion. Some problems may even ask you to write a short essay!

You can choose a topic of your interest to work on this project. Your topic must be about how to use calculus (in mathematics, science, engineering, economics, etc.). This will be **due on 12/9 (Mon)**.

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.

To receive disability-related academic accommodations for this course, students must first be registered with their school's Disability Services (DS) office. Detailed information is available online for both the Columbia and Barnard registration processes.

- Columbia DS: `https://health.columbia.edu/services/register-disability-services`
- Barnard CARDS: `https://barnard.edu/disabilityservices/register-cards`

Refer to the appropriate website for information regarding deadlines, disability documentation requirements, and drop-in hours (Columbia)/intake session (Barnard).

For this course, students registered with the Columbia DS should refer to the DS Testing Accommodations page

`https://health.columbia.edu/services/testing-accommodations`

for more information about accessing exam 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.