

MATH 2551 MULTIVARIABLE CALCULUS

Lectures C & HP; Studios C01, C02, C03, C04, C05, C06, HP1

Spring 2025

1. Course Information

Course Title: Multivariable Calculus

Lecture Meeting Times: Lecture C/HP - TR 9:30 am - 10:45 am

Lecture Meeting Location: East Architecture 123

Studios Meeting Information:

| Studio | Time | Room | Teaching Assistant |
|---------|------------------|-----------------------|--------------------|
| C01 | MW 12:30-1:20 pm | Skiles 255 | Xiying Du |
| C02 | MW 12:30-1:20 pm | Skiles 268 | Aidan Latona |
| C03 | MW 8:25-9:15 am | Skiles 254 | Xiying Du |
| C04 | MW 8:25-9:15 am | Skiles 246 | Anand Hande |
| C05/HP1 | MW 12:30-1:20 pm | East Architecture 107 | Neha Dossani |
| C06 | 8:25-9:15 am | Skiles 256 | Aidan Latona |

1.1 Course Content

Math 2551 is an introduction to multivariable calculus. Topics include:

- Vectors and the geometry of space, vector calculus, parametric curves and motion
- Functions of several variables, visualization and partial differentiation, gradients, linear approximation, tangent planes, differentials, optimization, Lagrange multipliers
- Double and triple integrals, applications
- Vector analysis including the theorems of Green, Gauss, and Stokes

A more detailed list of learning outcomes is available on the course Canvas page.

2. Instructor and TA Contact Information

Instructor: Dr. Hunter Lehmann

Instructor Office: Skiles 218C

Instructor Email: hlehmann3@gatech.edu.

Instructor Drop-In Hours: Monday 3:00 - 4:00 pm via Zoom

Tuesday 12:30 - 1:30 pm in Skiles 218C

Thursday 11:00 am - 12:00 pm in Skiles 218C

If none of these drop-in hours are possible for you to attend, let me know via email and we can arrange some other time to meet.

TA Contact Info:

| Teaching Assistant | Email | Office | Office Hours |
|--------------------|----------------------|------------|---------------------------------|
| Xiying Du | xdu90@gatech.edu | Clough 280 | Tuesday 1:30 - 2:30 pm |
| Aidan Latona | alatona6@gatech.edu | Clough 280 | Monday 3:00 - 4:00 pm |
| Anand Hande | ahande3@gatech.edu | Clough 280 | Thursday 3:30 - 4:30 pm |
| Neha Dossani | ndossani3@gatech.edu | Skiles 230 | UTA Tutoring (Wednesday 2-3 pm) |

3. Pre-Requisites

- Calculus II: At least one of MATH 1555, MATH 1552, MATH 15X2, MATH 1X52
- Linear Algebra: At least one of MATH 1553, MATH 1554, MATH 1564, MATH 1X53, MATH 1X54

4. Textbook

Thomas, Calculus: Early Transcendentals 15th edition by Addison-Wesley (Pearson). The textbook is not required for the class; many good references for the material of MATH 2551 can be found online or at the campus library.

A few online resources are listed below in no particular order:

- OpenStax Multivariable Calculus
- APEX Calculus
- Active Calculus - Vector Calculus
- Diana Davis' Multivariable Calculus
- Paul's Online Notes
- Khan Academy Multivariable Calculus

5. Course Websites

Course Website: gatech.instructure.com

Canvas will be used for course grades, lecture videos, announcements, and course-related documents. Links to the other websites in this section can be found on Canvas as well.

Ed Discussion: <https://edstem.org/us/courses/69959/discussion/>

The Ed Discussion forum is highly catered to getting your help fast and efficiently from classmates, the TAs, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Ed Discussion if your questions have nothing to do with your privacy. You may post on Ed Discussion anonymously to your fellow students if that makes you more comfortable. Everyone in class should feel absolutely free to ask questions, discuss, help, comment, explore, and exchange ideas on Ed Discussion. The only restriction on questions I impose on Ed Discussion is: please do not discuss exam problems until after grades are released.

WeBWorK: We will use the free homework platform WeBWorK for homework in this course. You will access WeBWorK through Canvas. Some information about entering answers into WeBWorK can be found online here, or you can ask on Ed Discussion if you are having difficulty with the format of any answer.

Gradescope: Grading of quizzes and exams will be done on Gradescope. See the following section for details. You will access Gradescope through Canvas.

Dr. H's Personal MATH 2551 Webpage: <https://hunterlehmann.github.io/teaching/MATH2551/>

This page is meant to publicly collect resources for MATH 2551 at Georgia Tech from my time teaching the course. Most or all of these are also available on our Canvas site.

6. Course Requirements & Grading

6.1 Homework

Homework will be due on most **Tuesdays and Thursdays at 10:00 pm** through WeBWorK. There are a total of 245 homework points available in the course. The homework component of your grade will be **the fraction of points you earn out of 173**, capped at 100%. If you complete all of the weekly homework sets, you will meet the point cap. The practice problem sets and review problem sets are there to give you some leeway with the weekly assignments and to provide extra practice should you desire it for exams. All homework due dates are posted already in WeBWorK and the course calendar.

6.2 Quizzes, Exams, & Regrades

- **Quizzes:** We will have a 10-minute quiz in studio on most Wednesdays. Each quiz is worth 4 points and there will be 10 of them for a total of 40 points. The quiz component of your grade will be **the fraction of points you earn out of 36**, capped at 100%. No books, notes, calculators, cell phones, or other electronic devices are allowed during quizzes and exams.
- **Midterm Exams:** We will have three midterm exams, which will take place **during lecture** on the following dates:
 1. Tuesday, February 4
 2. Thursday, March 6
 3. Thursday, April 17
- **Regrades:** Quizzes and exams will be graded through Gradescope. Once an assessment is graded, you will have one week to submit a regrade request. You can do this by accessing Gradescope from Canvas, clicking the option for a regrade request, and following the instructions. Regrade requests will not be considered unless they are made in this manner through Gradescope.
 - Regrade requests must reference a specific rubric item and specific part of the solution key that were not applied correctly.
 - Regrade requests may result in your grade being decreased if I observe that your solution was originally graded too generously
 - Regrade requests that do not reference a specific rubric item or part of the solution key will be ignored.
- **Final exam:** The final exam in this class serves as an opportunity for you to demonstrate increased mastery of the concepts of the course. It will consist of three parts, corresponding to the three midterm exams. Each part is optional; you may choose to take anywhere from none to all three parts.

By taking any part of the final, you can only increase your grade in the course: the corresponding midterm grade will be replaced by the final grade, if this is higher. If the final exam part grade is lower, your grade will remain unchanged.

Out final will be on Thursday May 1 from 8:00 to 10:50 am in TBD (most likely our usual lecture hall). For the full final exam schedule, see [the registrar's schedule](#). **Only under extreme extenuating circumstances** will you be able to take the final exam at a different time or date. Early travel plans (including already-purchased tickets) are **not** an acceptable reason for this.

6.3 Grade breakdown

Your final grade in the class will be computed according to the table below. Canvas will not accurately reflect your grade during the semester!

| Grading scheme: |
|----------------------------------|
| 10% Homework |
| 15% Quizzes |
| 25% Max(Midterm 1, Final Part 1) |
| 25% Max(Midterm 2, Final Part 2) |
| 25% Max(Midterm 3, Final Part 3) |

6.4 Grade Incentives

- **Studio Attendance:** Each day of studio after the first week of class will have 2 points available to earn, the first for attending, and the second for actively participating in mathematics. If you obtain at least 44 of the 52 available points, you will receive a bonus of 1.5% to your overall grade at the end of the semester. Attending a studio you are not registered for will result in 0 studio attendance points.

- **CIOs:** I strongly value your feedback about the course. If at least 85% of all Math MATH 2551 C students complete CIOs evaluations by 8:00 am May 1, the quiz component of your grade will be computed out of 32 points rather than 36 points (capped at 100% still).

6.5 Grade assignments

After *all* grades are in and all overall percentage scores for students have been computed using the weights described above, grades are assigned. The standard cutoffs are as follows.

A: [90%, 100%] B: [80%, 90%) C: [70%, 80%) D: [60%, 70%) F: [0%, 60%)

Grades will not be rounded, but grade cutoffs may be adjusted at the end of the semester. So, to guarantee an A, get 90% or better overall. To guarantee at least a B grade, get 80% or better overall, etc.

7. Course Expectations & Guidelines

7.1 Students with Disabilities and/or in need of Special Accommodations

Georgia Tech complies with the regulations of the Americans with Disabilities Act of 1990 and offers accommodations to students with disabilities. If you are in need of classroom or testing accommodations, please make an appointment with the Office of Disability Services to discuss the appropriate procedures. More information is available on their [website](#). Please also make an appointment with me to discuss your accommodation, if necessary.

7.2 Statement of Intent for Inclusivity As members of the Georgia Tech community, we are committed to creating a learning environment in which all of our students feel safe and included. Because we are individuals with varying needs, we are reliant on your feedback to achieve this goal. To that end, we invite you to enter into dialogue with us about the things we can stop, start, and continue doing to make the classroom an environment in which every student feels valued and can engage actively in our learning community.

7.3 The Honor Code and Academic Dishonesty

Do not cheat! Abide by the [honor code](#) at all times. See <http://honor.gatech.edu> and [here](#).

Any evidence of cheating or other violations of the Georgia Tech Honor Code will be submitted directly to the Office of Student Integrity. Cheating includes, but is not limited to:

- Using a calculator, books, or any form of notes on quizzes or tests.
- Copying directly from any source, including friends, classmates, tutors, internet sources, or a solutions manual.
- Allowing another person to copy your work.
- Taking a test or quiz in someone else's name, or having someone else take a test or quiz in your name.
- Asking for a regrade of a paper that has been altered from its original form.

Cheating does not include working together with your friends and classmates on your homework. You may use AI and other tools to help you get started on your homework, but relying heavily on these will likely result in poor performance on quizzes and exams if you do not develop your own understanding of the material. AI tools also frequently make mathematical errors, so be careful in applying them.

7.4 Missed work policy

If you have to miss class on a day when a quiz or exam is scheduled for any of the following reasons or any other personal emergency, I will work with you to make up the assessment, as long as you are in communication with me in a timely manner.

- **University-approved absences:** Please give me notice by the second Wednesday of the semester, or as soon as possible once your absence has been approved.
- **Religious holiday:** By the second Wednesday of the semester, you should notify me of any classes (including studio) you will miss due to religious holidays.

- **Illness:** Except under extenuating circumstances, you should notify me *in advance* and for cases where you are ill enough to need medical care, provide the Office of Student Life with appropriate documentation, so that they can confirm it with me. Illnesses such as COVID, colds, flu, or other such illnesses where you feel unwell and don't want to infect others but do not feel ill enough to visit a doctor do not need documentation.
- **Family or personal emergency:** Notify me as soon as possible and when applicable (for extended absences) provide the Office of Student Life with appropriate documentation, so that they can confirm it with me.

If you do not communicate with me about your absence to set up a make-up opportunity within a week, missed quizzes and missed exams result in a 0.

In the case of an excused absence for a quiz, you will be able to take a make-up quiz if this make-up occurs within a week of the quiz itself. Otherwise, your grade for the excused quiz will be your median grade on the other quizzes.

If you have an excused absence for an exam, then you may take a make-up exam at 11:00 am on the Tuesday or Thursday listed on the course calendar; typically a week after the exam. If this is not possible, then your corresponding unit exam grade will come solely from that section of the final exam.

Any assignment for which no paper is received will be given a 0.

7.5 Email policy

I will respond to emails within one to two business days. Emails sent after 5:00 pm will not receive a response until the next day. Emails sent on the weekend will not receive a response until Monday.

For questions relating to course structure, please check the syllabus first. Exam dates, policies, etc. are available on the syllabus.

Let's not discuss grades by email. Any questions about grades should be asked during office hours or in an appointment scheduled outside of office hours. **In particular, do not send me emails at the end of the semester asking for your grade to be changed. They will not help in any case.**

Let's not discuss math by email. Let's discuss mathematics on Ed Discussion instead! This will open the question to the entire class, including all TAs and other students who may be able to provide insight. We can also discuss questions during office hours, or at a scheduled appointment outside of office hours.

7.6 Extra credit & calculators

There is **no extra credit**, except possibly in the form of a bonus question on an exam. There are also no quiz re-takes or exam re-takes.

You can use calculators to check your computations when doing homework. You are **NOT allowed to use a calculator on quizzes or exams.**

7.7 Attendance in lecture and studio

You are expected to come prepared and actively participate in every lecture and studio session.

Class disruptions of any kind will not be tolerated and may result in your removal from the classroom. Please show courtesy to your fellow classmates and instructor by adhering to the following class rules: keep use of electronic devices focused on class-related activities, come to class on time and stay for the entire class period, refrain from conversing with your fellow students about non-mathematical topics during class, and put away any reading materials unrelated to the course.

In the event of an absence, you are responsible for all missed materials, assignments, and any additional announcements or schedule changes given in class.

7.8 Waitlists, Registration, Permits, etc.

Instructors are forbidden from doing anything regarding class registration. They cannot issue permits, remove students from waitlists, etc. For guidelines on such matters, please consult <https://math.gatech.edu/permits-and-waitlists>.

7.9 Digital Learning Days: In cases where campus may be physically closed due to events such as inclement weather, a digital learning day may replace in-person classes. Should this event occur on a lecture day, then lectures will either be streamed live, or a recording will be posted for students to watch asynchronously. Should this event occur on a studio day, then studios will be streamed live if possible or a recording will be posted for students to watch asynchronously (possibly after the digital learning date); studio sections may be combined if there are TAs who are unable to stream class live. No studio participation will be counted on a digital learning day and classwork points will be adjusted accordingly. If a digital learning day occurs on a midterm exam date, then class lectures will meet online or asynchronously instead, and that exam will be rescheduled to the next lecture day.

8. Campus Resources

In this section you can find resources on campus that are designed to help you succeed as best as possible.

8.1 Additional resources and tutoring

Additional Help in the Math Lab: Asking questions is a key to success! Free “walk-in” help is available Monday-Friday in the “Math Lab” for 1000-3000 level courses. You can view the schedule at <https://tutoring.gatech.edu/drop-in/>. The Math Lab is located in Clough 280.

1-to-1 and Small Group Tutoring with UTAs: Free 1-to-1 and Small Group Tutoring in-person is available for 1000 and 2000 level classes. Tutoring is available with any UTA by appointment here: [UTA Tutoring](#) and will be located in Skiles 230.

We also have [PLUS sessions](#). A comprehensive list of tutoring resources is available [here](#).

8.2 Georgia Tech Resources for Personal Support

The Office of the Dean of Students: 404-894-6367; Smithgall Student Services Building 2nd floor. You also may request assistance [here](#)

Counseling Center: 404-894-2575; Smithgall Student Services Building 2nd floor

Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention. Their website also includes links to state and national resources. Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at 404-894-2204.

Students' Temporary Assistance and Resources (STAR) Can assist with interview clothing, food, and housing needs.

Stamps Health Services: 404-894-1420; Primary care, pharmacy, women's health, psychiatry, immunization and allergy, health promotion, and nutrition.

OMED: Educational Services

Women's Resource Center: 404-385-0230

LGBTQIA Resource Center: 404-385-2679

Veteran's Resource Center: 404-385-2067

Georgia Tech Police: 404-894-2500