Syllabus: MATH 2551RBS Multivariable Calculus (4 credit hours)
Fall 2026 - Georgia Tech Barcelona Spain Fall Study Abroad Program

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GENERAL INFORMATION

Course Description

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, optimization, Lagrange multipliers, linear approximation, tangent planes, differentials
--Double and triple integrals, cylindrical and spherical coordinates, applications
--Vector analysis including the theorems of Green, Gauss, and Stokes

Learning Outcomes

The primary goal of MATH 2551 is to prepare students to succeed in upper-level courses that have this course as a prerequisite. Upon successful completion of the course, students will be able to:
-- Describe three-dimensional vectors, surfaces, and multivariable functions geometrically.
-- Analyze vector-valued functions using calculus to characterize motion and paths in two and three dimensions.
-- Calculate and interpret derivatives of multivariable functions to describe and estimate how such functions change.
-- Analyze and solve multivariable optimization problems.
-- Construct and evaluate integrals of multivariable functions using Cartesian and other coordinate systems.
-- Construct and evaluate integrals of scalar and vector functions over curves and surfaces using the theorems of Green, Gauss, and Stokes.
-- Apply these integrals and theorems to model physical quantities such as flux and circulation.
-- Contextualize mathematical quantities involving multivariable functions to interpret their meaning within problems that arise in everyday life or to give a geometric interpretation of them.

Pre-Requisites

Calculus II: At least one of MATH 1552 or MATH 1X52
Linear Algebra: At least one of MATH 1553, MATH 1554, MATH 1564, MATH 1X53, MATH 1X54

Required Course Materials

Textbook: Thomas, *Calculus: Early Transcendentals, 15th edition* by Addison-Wesley (Pearson). We will discuss topics in chapters 12-16. 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:
- Paul's Online Notes - https://tutorial.math.lamar.edu/classes/calciii/calciii.aspx
- APEX Calculus - http://www.apexcalculus.com/downloads
- Active Calculus - Vector Calculus - https://activecalculus.org/2023/08/22/active-calculus-multivariable/
- Diana Davis' Multivariable Calculus - https://dianadavis.github.io/mv/index.html
- Khan Academy Multivariable Calculus - https://www.khanacademy.org/math/multivariable-calculus

GRADING POLICY AND COURSE REQUIREMENTS

HOMEWORK (HW): We will use the free homework platform WeBWorK for most of the homework in this course. You will access **WeBWorK** through Canvas. Working problems is an essential part in learning mathematics! You are expected to understand all homework problems and problems from class for the tests. The due date for WeBWorK assignments is available on the WeBWorK page. **The HW is due at 11:59 p.m. local time on the due date. No late homework will be accepted. [In August, assignments will be due at 11:59 pm Atlanta time on the due date. In Spain, assignments will be due at 11:59 pm Barcelona time on the due date.]**

The maximum HW score for this course is 60. There will be a 245 homework points available in WeBWorK the course. To receive a HW score of 60, a student needs to earn 175 points or more in WeBWorK. The homework component of your grade (HW score) will be 60 times [the fraction of the points you earn out of 175, capped at 100%]. If you earn 175 homework points or more, then you will have a HW score of 60. If you complete 140 homework points (140 is 80% of 175), then you will have 80% of 60 = 48 counting toward the HW score. If you complete 105 homework points (105 is 60% of 175), then you will have 60% of 60 = 36 counting toward the HW score. Etc. Let me know if you have questions.

PARTICIPATION/ATTENDANCE/WORKSHEETS/QUIZZES: Attendance is required. Students are expected to come prepared and to actively participate in working the problems and class discussions. There will be several worksheets to be completed outside of class. We will have regular worksheets in class. In the event of an absence, you are responsible for all missed materials, assignments, and any additional announcements or schedule changes given in class. We may have some quizzes that will contribute to this grade.
Students can earn a score up to 40 in PARTICIPATION/ATTENDANCE/WORKSHEETS/QUIZZES.
Let me know if you have questions.

EXAMS: We will have four 50-minute midterm tests and one 2 hour-50 minute final exam.

FINAL EXAM: Tuesday October 13 9:00-11:50 AM (Comprehensive and required)
No books, calculators, cell phones, or other electronic devices are allowed during the tests and the final exam without explicit instructor approval.

GRADES:

a. Homework (60) + Part/Attend/Worksheets/Quizzes (40)	100
b. Test 1	100
c. Test 2	100
d. Test 3	100
e. Test 4	100
f. Final Exam	100
g. Final Exam	100

The lowest score from items a-g (in the righthand column) will be dropped. There are 600 possible points. Note that the score on the Final Exam will count once or twice in the 600 possible points, depending on a student's score on the final exam relative to the other categories. The course will be graded on the basis of 600 points. There is a total of 600 points. A student's course grade will be determined by the scale below
A: [540, 600] 90% or higher
B: [480, 540) 80% guarantees a B
C: [420, 480) 70% guarantees a C

D: [360, 420) 60% guarantees a D
F: less than 360 points; less than 60%

Scores as not rounded up – so a student needs 540 points for more to earn an A.
I reserve the right to modify the scale and will only do so in the case all student grades on the new scale are at or above the grade on the original scale.

CLASS ATTENDANCE

Attendance is required. Students are expected to come prepared and actively participate in every class period.

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:

- Turn off all laptops, cellular phones, i-pods and other electronic devices, unless you have a documented need to use such devices for note taking, during class or unless we are using them in class.
- Come to class on time and stay for the entire class period.
- Except during group work and class discussions, please refrain from conversing with others.
- Put away any reading or other materials unrelated to the course.

Make-Ups and missing class: You must take the exam at the assigned lecture time. In most cases, make-ups can only be given if advance notification is given with proper supporting documentation (such as a Dean of Student's letter). If possible, make-ups must be completed before the corresponding test has been graded and returned to other students. If you will miss a test due to a university-sponsored event or athletics, please provide me with the official documentation in advance. If you will miss a test or class for a religious holiday, please notify me by August 26, 2026 of any classes you will miss due to religious holidays.

STUDENT-FACULTY EXPECTATIONS AGREEMENT

At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgment, and responsibility between faculty members and the student body. See http://www.catalog.gatech.edu/rules/22/ for an articulation of some basic expectation that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class. As your instructor, my role is to facilitate the lectures and class interactions, provide you with ample assignments and assessments to gauge and enhance your understanding and knowledge of the subject matter, provide feedback on your work, and be available for assistance when needed.
As students, you are expected to take your responsibility seriously, attend and participate in all of the class discussions and activities, behave in a respectful manner to both your instructor and fellow students, complete all assignments in a timely and professional manner, read relevant materials before class, study the subject matter outside of class time, and ask for help when needed.

COURSE EXPECTATIONS & GUIDELINES

Accommodations for Students with Disabilities: 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. https://disabilityservices.gatech.edu/ Please also make an appointment with me to discuss your accommodation, if necessary.

Honor Code and Academic Dishonesty: Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit http://www.catalog.gatech.edu/policies/honor-code/ or http://www.catalog.gatech.edu/rules/18/. Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations. Cheating includes, but is not limited to:

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

**AI-based Assistance

Note: The Midterm Exams and the Final Exam will be in-class. You will not have access to the internet or colleagues on these examinations.

Regrading of Papers: If a problem on your test has been graded in error, you must submit a regrade request **in writing,** along with your paper within 2 days of when the papers have been returned in class. *Do not change or add to the work on your paper!*

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.

Since this course is offered as part of a study abroad program, dropping the course is not permitted. In addition, Institute policies regarding Final Instructional Class Days and Reading Periods are not applicable. Be sure to review the academic course schedule for this study abroad program course.

Email policy: I will respond to emails within one business day. Emails sent after 6:00 pm will not receive a response until the next day. Emails sent on the weekend will not receive a response until Monday.

Calculators: While you may choose to use a scientific calculator for help with some of the homework and worksheet problems, the use of calculators is NOT ALLOWED on in-class assessments.

ACADEMIC SUPPORT WHILE ABROAD

Given the typically small class sizes associated with study abroad programs, students are encouraged to seek academic assistance from their instructors or teaching assistants during scheduled office hours or by arranging individual appointments, as needed. In addition, students may access free tutoring services through Georgia Tech Knack (see success.gatech.edu/tutoring for more information). Students are also expected to notify the instructor and/or program director promptly if circumstances arise that may adversely affect their academic performance.