

MATH 1551 M2, Differential Calculus, Course Syllabus

Welcome to Differential Calculus. This course is designed to introduce you to some fundamental concepts of single variable Calculus. All of our students play an important role in our educational mission. We hope that you will find this to be a useful, fundamental course for your future studies.

Please note: items on the syllabus are subject to change. Any changes to the syllabus will be relayed to the students in lecture and through T-Square.

Goals, Learning Objectives, and Topics

The primary **goals** of this course are to

1. explore fundamental concepts of single variable calculus
2. explore the solution of problems from a mathematical perspective, and to
3. help prepare students to succeed in upper level math, science, engineering and other courses that require calculus.

For example, with respect to item 3, we might discuss effective study strategies during lecture.

Learning objectives are statements that articulate what students are expected to be able to do in a course. The learning objectives for this course are as follows.

- **Construct** mathematical expressions and graphs involving functions and their derivatives.
- **Compute** mathematical quantities using differential calculus and **interpret** their meaning.
- **Analyze** mathematical statements and expressions (for example, to assess whether a particular statement is accurate).
- **Write** logical progressions of precise statements to justify and communicate mathematical reasoning.
- **Apply** calculus concepts to solve real-world problems such as optimization and related rates problems.

For example, students will be expected to **construct** related rate equations to **compute** the value of a variable and **interpret** the resulting value in the context of the given problem.

Some of the topics that are explored in this course include the following.

- Basic calculus concepts such as limits, derivatives, optimization.
- The graphing of functions using calculus.
- The use of differential calculus to solve physics, geometry, and optimization problems.

Course description, times and textbook

Course Title: Differential Calculus

Description: Differential calculus including applications and the underlying theory of limits for functions and sequences.

Prerequisites: Math SAT score of 600 or above, or equivalent Math ACT, or MATH 1113 Precalculus.

Course Meeting Times: Lecture meets 15:00 to 15:50 on Monday, Wednesday and Friday at Engineering Science & Mechanics Building 201.

Text: Thomas, Calculus: Early Transcendentals, 13th ed. MyMathLab is required and contains an electronic version of the textbook. Access codes and registration information are available on our course t-square page. You can access our MyMathLab course at mymathlab.com. We will cover many of the topics in chapters 1-5.

The MyMathLab CourseID is **scott65747**

Course Websites

Course Website: <http://people.math.gatech.edu/~sscott42/teach/1551fall17/math1551.html>

Private Grade Information: t-square.gatech.edu (required)

Textbook/Homework Access: <http://www.mymathlab.com> (required)

On-line Discussions: <https://piazza.com/gatech/fall2017/math1551m2/home> (required)

Instructor and Contact Information

Instructor: Shane Scott

Office Location: Skiles 252

Office Hours: See course site

E-mail: scottsha@gatech.edu

Lecture Assistant: Jaewoo Jung

Office Hours and Location: To be announced.

E-mail: jaewoojung@gatech.edu

MyMathLab Course Information:

We will be utilizing MyMathLab (MML) for homework through a joint code for the Thomas Calculus text and the Lay Linear Algebra text. In order to register, you will need our course id listed below.

The MyMathLab CourseID is **scott65747**

Important notes on MML:

- If you already have an account on MyMathLab using this combined textbook within the past 18 months, then you do not need to purchase a new code. Login to your account on MyMathLab, select the option to add a new course, and enter our course ID.
- If you already have a MyMathLab account that used either the Thomas or the Lay textbook in the past 18 months, but you were unable to add our course using the previous step, please send an email to Lyndsee.Hewston@Pearson.com and include the following information:
 1. Your First and Last Name
 2. The email address used to register for MML
 3. Your Login ID for MML
 4. Our course ID (listed above)

You should receive a reply within 36 business hours from the Pearson support team regarding your account status. In the meantime, you can access our course using the “temporary access” option when registering. Please do not pay for a new code until you receive a reply from Pearson.

- If you do not have a MyMathLab account using the Thomas or Lay textbooks, or if your account is over 18 months old, you will need to purchase a new code for our course. Please refer to the registration document, located in the “Resources” section on t-square, to create your new account.

When signing up for MyMathLab, it will be immensely helpful to me (for grading purposes) if you will set your STUDENT ID to your USERID for the GT system (i.e., your T-square USERID, as in “gburdell3”, etc).

MyMathLab comes with an entire electronic version of the textbook; it is your choice if you would also like to own the textbook in print. You may purchase a MyMathLab code either from the bookstore or on-line while registering at <http://www.mymathlab.com>. If you prefer to own a hardcopy of the text, the bookstore offers packages of MyMathLab combined with a loose-leaf or hardcover version of the Thomas textbook that is less expensive than purchasing the text and code separately.

PLEASE NOTE: GEORGIA TECH HAS A SPECIAL CODE PACKAGE THAT INCLUDES BOTH TEXTBOOKS. THIS CODE CAN ONLY BE PURCHASED THROUGH THE CAMPUS BOOKSTORES OR DIRECTLY FROM PEARSON. CODES PURCHASED BY OTHER VENDORS WILL NOT WORK! Possible ISBNs for this text are: 1323131760, 1323132112, 132313204X, 1323132104, or 1323132120.

Course Organization

This course will consist of lectures meeting three times per week for 50-minute periods. You are required to attend all scheduled sessions at all times. After the first week of class, Fridays will be reserved for review and testing.

Course Requirements and Grading

HOMEWORK: Homework will be assigned on-line and will consist of exercise problems on MyMathLab. You are expected to understand all homework problems for the tests. Exercises on MyMathLab will be due on Thursdays at 11:59 PM (except during class recesses or as announced in class). The lowest homework grade will be dropped. Late assignments are allowed with a penalty of 20% per day.

I will also expect you to read ahead to prepare for each class lecture.

PARTICIPATION: Attending class is important. Class attendance and participation will be recorded and scored on a 0-2 scale. The purpose of participation activities is to encourage participation and active learning, gauge attendance, develop community among the students, offer feedback to the instructor on course activities, and help students better prepare for quizzes and midterms. Participation activities will not be held in the first and last weeks of the course, and will only be graded for participation (not for accuracy). Examples of participation activities that will be used through out the semester are: paper-based work (e.g. minute paper, individual problem solving, group work) or online

work: piazza survey, etc.

QUIZZES: A weekly quiz will be given each Friday beginning on the second week of class, except on test days. Quizzes will be administered during the last 10 minutes of class, and will be based on reading material, topics covered in lecture and the homework assignments due that week. The lowest quiz grade will be dropped. No book, notes, calculators, cell phones, or other electronic devices are allowed during the quizzes.

MIDTERM EXAMS: We will have three 50-minute tests during the term. Midterms will last for entire class period. Tests will be administered on the following days:

- Test 1: September 22nd, covers chapters 1 and 2 (except for section 2.3)
- Test 2: October 20th, covers sections 3.1 to 3.9
- Test 3: November 17th, covers sections 3.10, 3.11, 4.1 to 4.6.

No books, notes, calculators, cell phones, or other electronic devices are allowed during the tests.

FINAL EXAM: The final exam will cover all course materials and will be administered on Thursday Dec 7, from 6:00 pm-8:50 pm. All students must take the final examination.

Your final average will be computed as the highest of the following two options:

Option	Count all tests	Halve Lowest Test
Participation	2%	2%
Homework	8%	8%
Quizzes	12%	12%
Midterms (16% each)	48%	40%
Final Exam	30%	38%

Letter grades will be determined based on the following intervals. **You will be guaranteed a minimum of the following scale:**

A: 90% and higher, **B:** [80%, 90%), **C:** [70%, 80%), **D:** [60%, 70%), **F:** [0%, 60%).

Any changes to these intervals would only be made after the final exam at the instructor's discretion and students should not expect any changes to the intervals. The cutoffs could only be lowered.

Verification of Participation will be submitted by September 11th.

Midterm grades will be assigned on September 29th. A satisfactory grade will be assigned to all students with a midterm average of 70% or higher (based on the above weighting of grades).

Class Policies

Attendance: You are expected to come prepared and actively participate in every lecture session. In the event of an absence, you are responsible for all missed materials, assignments, and any additional announcements or schedule changes given in class.

Class disruptions of ANY kind will NOT be tolerated and may result in your removal from the classroom and/or loss of participation points for that day.

Please show courtesy to your fellow classmates and instructor by adhering to the following class rules:

- Read the text sections before arriving at class.
- Come to class on time and stay for the entire class period.
- Except during group work, please refrain from conversing with your fellow students.
- Put away any reading materials unrelated to the course.

Academic Dishonesty: All students are expected to comply with the GeorgiaTech Honor Code (the honor code can be found at <http://www.osi.gatech.edu/plugins/content/index.php?id=46>). Any evidence of cheating or other violations of the Georgia Tech Honor Code will be submitted directly to the Dean of Students.

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 (including Wolfram Alpha), 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.
- Using someone else's clicker to gain attendance points or to take quizzes or tests for them, or asking someone else to use your clicker for any graded or attendance submission.

Regrading of Papers: If a problem on your test or quiz has been graded in error, you must submit a regrade request in writing, along with your paper, no more than one week after the papers have been returned in class. Should you wish to have your paper regraded, *do not change or add to the work on your paper!* If you must write on your returned paper, be sure to write in a different color ink and clearly indicate what you have added. A regrade request can only be submitted if you have done something CORRECT on your test that has been marked as incorrect. You MUST check your answers with the solutions BEFORE submitting such a request.

Make-Ups: In an emergency situation, I may allow a make-up quiz or test if I am notified prior to the exam and provided with a reasonable, written confirmation of your absence. Any make-ups must be completed before the corresponding quiz or 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.

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 ADAPTS office to discuss the appropriate procedures. More information is available on their website, <http://www.adapts.gatech.edu>. Please also make an appointment with me to discuss your accommodation, if necessary.

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

Announcements: I will frequently update the class pages with class information and materials. You are responsible for obtaining any announcements or materials placed on my web page, MyMathLab, or Piazza (www.piazza.com) so you can view/participate in course-related discussions.

Additional Help: Asking questions is a key to success! Please stop by my office hours whenever you have questions. Free help is also available Monday-Thursday afternoons in the Math Lab, located on the second floor of Clough Commons.

Important Dates throughout the term:

- Aug 21 -- First Day of Classes
- Sep 4 -- Official School Holiday (Labor Day)
- Sep 22 -- Midterm #1
- Oct 9-10 -- Fall student recess (NO CLASS)
- Oct 20 -- Midterm #2
- Oct 28 -- Last day to withdraw with a grade of "W"
- Nov 17 -- Midterm #3
- Nov 22-24 -- Thanksgiving Student Recess and Institute Break (NO CLASS)
- Dec 4 -- Last Day of Class
- Dec 7 -- Final Exam at 6:00 pm - 8:50 pm

For further information on campus-wide dates see <http://registrar.gatech.edu/calendar>

Tentative Course Schedule and Assessments

Please use this as an approximate class schedule; section coverage may change depending on class performance. MML=MyMathLab

Week and Dates	Section Coverage	Topics
Week 1 Aug 21-25	Sections 1.1-1.2 Sections 1.3-1.6	Functions, graphs, combining functions. Trigonometric, Exponential, Logarithmic and Inverse Functions Piazza Homework #0 due Thursday
Week 2 Aug 28-Sep 1	Sections 2.2, 2.4	Limits. One-sided limits MML Homework #1 due Thursday Quiz 1 on Friday
Week 3 Sep 4-8	Labor day on Monday Section 2.5	Continuity MML Homework #2 due Thursday Quiz 2 on Friday
Week 4	Sections 2.6, 2.1	Infinite Limits. Rates of Change

Sep 11-15		MML Homework #3 due Thursday Quiz 3 on Friday
Week 5 Sep 18-22	Sections 3.1, 3.2 Test Review	Secant and Tangent Lines. Definition of Derivative MML Homework #4 due Thursday Midterm 1 on Friday (Chapters 1 & 2)
Week 6 Sep 25-29	Section 3.3, 3.4	Power, Product, and Quotient Rules. Rates of Change MML Homework #5 due Thursday Quiz 4 on Friday
Week 7 Oct 2-6	Sections 3.5, 3.6	Derivatives of Trigonometric Functions. Chain Rule MML Homework #6 due Thursday Quiz 5 on Friday
Week 8 Oct 9-13	Fall Recess Oct 9-10 Sections 3.7-3.8	Implicit Differentiation. Derivatives of Inverse and Logarithmic Functions MML Homework #7 due Thursday Quiz 6 on Friday
Week 9 Oct 16-20	Section 3.9 Test Review	Inverse trigonometric functions MML Homework #8 due Thursday Midterm 2 on Friday (Sections 3.1-3.9)
Week 10 Oct 23-27	Sections 3.10, 3.11	Related Rates. Differentials MML Homework #9 due Thursday Quiz 7 on Friday
Week 11 Oct 30-Nov 3	Sections 4.1, 4.2	Extreme Values. The Mean Value Theorem MML Homework #10 due Thursday Quiz 8 on Friday
Week 12 Nov 6-10	Sections 4.3, 4.4	First and Second Derivative Tests MML Homework #11 due Thursday Quiz 9 on Friday
Week 13 Nov 13-17	Section 4.4 Test Review	Curve Sketching MML Homework #12 due Thursday Midterm 3 on Friday (Sections 3.10-3.11, 4.1-4.4)
Week 14 Nov 20-24	Section 4.6 Thanksgiving Nov 23-24	Optimization Problems
Week 15 Nov 27-Dec 1	Sections 4.7, 4.8	Newton's Method; Anti-derivatives MML Homework #13 due Thursday Quiz 10 on Friday
Week 16 Dec 4-5	Section 5.4. Review for Final Exam	The Fundamental Theorem of Calculus Final Exam on Thursday, Dec 7, 6:00-8:50 pm.