Analytic Geometry and Calculus II

Lectures: MW 4:30-6:20 pm, David King 1006

Recitations: Tuesdays

Instructor: Claire Merriman

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Office hours:

See Canvas

Grading:

Homework (WebAssign): 15%

Lecture Participation: 6%

Recitation Worksheets: 7%

Recitation Quizzes: 7%

Midterms: 45% (15% each)

Final Exam: 20%

Grading Scale:

A+	97-100	A	93-96	A-	90-92
B+	87-89	B	83-86	B-	80-82
C+	77-79	C	70-76		
D	60-69	F	0-59		

Quizzes

Roughly every other week in recitation.

Exams:

September 17, October 29, November 19

Final exam December 15 from 4:30 to 7:15 pm

Course Information

We start with an introduction to techniques and applications of integration, which will show that integration is far more complicated than derivation. Then we will look at more geometric concepts of calculus on parametric and polar curves. Finally, we will learn about infinite series including convergence tests and Taylor series.

Textbook and Software

Calculus: Early Transcendentals, by Stewart/Clegg/Watson (9th edition, Cengage publisher). We cover most of Chapters 6, 7, 8, 10, and 11.

We will also use **WebAssign**, which comes bundled with the book in various formats. Access Code for WebAssign is included with the purchase of a new book. You can register for free with temporary access for 14 days, then you will need to enter your purchased access code.

Exams and recitation participation will be graded and returned on **Gradescope**. Gradescope is available from Canvas, but it is easier to access if you also create an account with your GMU email address.

Some lecture participation assignments and visualizations will use **GeoGebra**. You do not need an account.

This course uses **Canvas** for course links, grades, and announcements.

You may use a basic four- or six-function calculator on the quizzes and exams. The calculator cannot have exponentials or trig functions.

Learning Outcomes

Upon successful completion of the course, students will be able to:

- Use definite integrals to find volume and area and solve some applied problems
- Find anti-derivatives using various integration techniques and determine which technique to use
- Evaluate some classes of improper integrals.
- Determine convergence or divergence of sequences and series using various convergence tests
- Use Taylor and Maclaurin series to represent functions.
- Use Taylor or Maclaurin series to integrate functions not integrable by conventional methods.
- Plot parametric and polar equations and use calculus techniques to find tangents and areas

Classroom Expectations

Learning mathematics requires you *do* mathematics. This means that you will spend part of class working on math problems, and you will have times that you struggle to solve them. The goal is for this to be a ***productive struggle***, where you emerge with a greater understanding of the concepts.

I expect this course to be a place where you will be treated with respect. All members of this class are expected to contribute to a respectful, welcoming, and inclusive environment for every other member of the class. Students are expected to abide by Mason's Non-Discrimination Policy affirm our belief that student diversity is an invaluable asset for enriching the learning that happens in our courses.

Assignment Descriptions

Lecture Participation

Throughout lecture, there will be short problems done either individually or as a group. These problems will primarily be through WebAssign, with some completed in GeoGebra or on paper. Since WebAssign will grade for correctness, you should check Canvas for your actual assignment grade.

The lowest 3 scores will be dropped. Dropped scores are intended to account for absences.

Recitation

Recitation attendance is expected. You will work with other students on practice problems, which will be submitted to Gradescope at the end of class. You must work with your group to receive full credit for the day. Students who are more than 10 minutes late must work in a separate group.

The two scores will be dropped. Dropped scores are intended to account for absences.

Quizzes

There will be short quizzes at the start of recitation roughly every other week.

You may use a basic four- or six-function calculator on the quizzes. You are not permitted to use any outside materials, resources, or other electronic devices (including but not limited to other calculators, mobile phones, smartwatches, etc.) on the quizzes. Any violation of this policy is a violation of the university's academic integrity policy.

The lowest quiz score will be dropped. Dropped scores are intended to account for absences.

Homework

WebAssign homework assignments will cover the material from the past week's lecture and are due at the start of class on Monday. There is one WebAssign assignment per textbook section, which typically translates to one or two per class day. These assignments are generally available on the Friday before the material is covered in class, 10 days before the assignment is due. Unfortunately, syncing WebAssign to the Canvas calendar prevents the grades from being calculated correctly.

You may use the automatic extension request button in WebAssign for a 48-hour extension with a 5% penalty. You may also manually request an extension, which I will grant with a 10% penalty up to four days after the original deadline. Please use the extension request features within WebAssign. You must request the extension before viewing the answers to the assignment or it will not go through

The lowest 3 scores will be dropped. Dropped scores are intended to account for any missing assignments for any reason.

Midterm Exams

There will be three midterm exams taken in class for the entire class period. Each midterm is worth 15% of your final grade.

A missed exam counts as a zero unless a valid excuse from a physician, the Dean's Office, or other official source is presented to your instructor and accepted. In rare circumstances, an extension might be granted for communicable illnesses that do not require a physician. You need to contact your instructor as soon as possible regarding your extenuating circumstance for consideration of an exception.

You may use a basic four- or six-function calculator on the quizzes. You are not permitted to use any outside materials, resources, or other electronic devices (including but not limited to other calculators, mobile phones, smartwatches, etc.) on the exams. Any violation of this policy is a violation of the university's academic integrity policy.

Your lowest midterm exam score will be replaced with the final exam score, as long as it is higher.

Final Exam

The final exam in this course is cumulative and will follow the same format as the midterms. You may use a four-function calculator on the exam. You are not permitted to use any outside materials, resources, or other electronic devices (including but not limited to other calculators, mobile phones, smartwatches, etc.) on the exams. Any violation of this policy is a violation of the university's academic integrity policy.

Readiness Reviews and Chapter Reviews in WebAssign

Completion of these assignments counts as extra credit. You may request extensions until the end of the course, but completion of chapter reviews before the relevant midterm counts as extra credit on your midterm grade.

WebAssign has "readiness review" assignments to review several key calculus 1 topics. These review assignments are optional and due at the start of the lecture that requires the topic. Chapter reviews are optional and due before the midterm on the chapter.

Ways to get help

Office Hours and Tutoring

The best way to succeed in this course is to ask for help before you fall behind. This includes working with your classmates and asking questions during class. Here are other ways to get help:

- **Office hours:** Office hours are a time I am in my office to help you with the material in the course. They can also be a time to meet or work with other students in the class. The Graduate Teaching Assistant (GTA) and Learning Assistant (LA) will also have office hours.
- **Email:** Please put "MATH 114" in the subject line. I will try to respond to emails within 24 hours on weekdays. Keep in mind that some math questions might be difficult to ask or answer via email—photos of your work help, but office hours are often more productive.
- **WebAssign's "Ask Your Instructor" feature:** You can message me questions about specific WebAssign problems. This will allow me to see your specific version of the question, along will your answers.
- **The Math Tutoring Center:** no appointment necessary tutoring provided by the mathematics department. See Tutoring Center website for information about how to access the Tutoring Center and for the current schedule.

Additional study resources

Our textbook has a **lot** of practice problems which you can find in the eBook available through WebAssign. I also recommend reviewing Paul's How to Study Mathematics.

Additionally, the following resources are helpful for reviewing the course material with a different presentation. They should be used *in addition* to the material course textbook and course notes—also be aware that the exact order of topics varies between resources.

I linked to the calculus 2 specific resources, but most also have resources to review prerequisite material:

- Paul's Online Notes—course notes/textbook with worked examples. The practice problems also have fully worked solutions. Resources are available for algebra through differential equations.
- Ohio State's Ximera Textbook—interactive textbook and homework system. Problems are integrated into the text, and you can check if your answer is correct. Resources are available for calculus 1, and I can provide precalculus resources that use the same software upon request.
- Active Calculus—online textbook with lecture videos from the authors.

Other course policies

Academic Honesty

George Mason has established institutional academic standards. Three fundamental principles to follow at all times are that:

1. all work submitted be your own, as defined by the assignment;

2. when you use the work, the words, or the ideas of others, including fellow students or online sites, you give full credit through accurate citations; and
3. if you are uncertain about the ground rules on a particular assignment or exam, ask for clarification. No grade is important enough to justify academic misconduct.

The use of “study sites,” such as Chegg and Course Hero, is not allow in this course. The use of generative AI, such as ChatGPT and Microsoft CoPilot, is not allowed in this course. Other computer aided math solvers, including integral solvers, may not be used on any assignments for this course

Late and missing work

For lecture participation, recitation worksheets, and homework, the dropped scores account for any missing work due to routine reasons (illness, commuting issues, work scheduling conflict, etc). In extreme, unavoidable situations that require missing more than a week of class, a makeup plan may be formulated upon the receipt of proper documentation. You need to contact your instructor as soon as possible regarding your extenuating circumstance for consideration of a makeup plan. Generally, makeup work for these assignments will only be permitted for documented reasons that require more than a week of absences.

A missed exam counts as a zero unless a valid excuse from a physician, the Dean’s Office, or other official source is presented to your instructor and accepted. In rare circumstances, a 24 extension might be granted for midterms in the case of communicable illnesses that do not require a physician. You need to contact your instructor as soon as possible regarding your extenuating circumstance for consideration of an exception.

Important dates

First day of classes: Monday, August 25

Last day to drop with 100% tuition refund: Monday, September 8

Last day to drop with 50% tuition refund: Tuesday, September 16

Last day for unrestricted withdrawal: Tuesday, September 30

Last day for selective withdrawal (W on transcript): Monday, October 27

Last day of classes: Monday, December 8

Final exam period: Wednesday, December 10 through Wednesday, December 17

Tentative course schedule—Adjustments to schedule will be in Canvas

Date	Topic
August 25	Introduction to the course, review of Calculus 1, Chapter 5 especially Reimann Sums in §5.1 and §5.5 The Substitution Rule
August 27	Overview of Integration Methods, §7.1 Integration by Parts, §7.2 Trigonometric Integrals
September 1	**No class, Labor Day** WebAssign due Tuesday this week
September 3	§7.2 Trigonometric Integrals, §7.3 Trigonometric Substitutions
September 8	§7.4 Integration of Rational Functions by Partial Fractions
September 10	§7.5 Strategies for Integration, §7.8 Improper Integrals
September 15	§7.8 Improper Integrals
September 17	**Exam 1: Integration methods (except improper integrals)**
September 22	§6.1 Area between Curves, §6.2 Volumes
September 24	§6.3 Volumes of Cylindrical Shells
September 29	§8.1 Arclength, §8.2 Area of surface of revolution
October 1	§6.4-6.5,8.3-8.5 Applications of Integrals (select topics)
October 6	§11.1 Sequences
October 8	§11.2 Series
October 13	**No classes, fall break** WebAssign due Tuesday this week
October 15	§11.3 The Integral Test and Estimation of Sums
October 20	§11.4 The Comparison Tests
October 22	**Exam 2: Chapters 6 and 8 (covered sections), Sections 11.1-3 (sequences and convergence of series through integral test)**
October 27	§11.5 Alternating Series and Absolute Convergence, §11.6 The Ratio and Root Test
October 29	§11.6 The Ratio and Root Test, §11.7 Strategies for Testing Series
November 3	§11.10 Taylor and Maclaurin Series, Preview of §11.11 Applications of Taylor Series
November 5	§11.10 Taylor and Maclaurin Series, §11.11 Applications of Taylor Polynomials
November 10	§11.8 Power Series
November 12	§11.8 Power Series, §11.9 Representations of Functions and Power Series
November 17	§10.1 Curves Defined by Parametric Equations

November 19	**Exam 3: Sections 11.4-11.11 (Comparison tests, Taylor and Maclaurin Series, Power Series)**
November 24	§10.2 Calculus with Parametric Curves
November 26	**No class, Thanksgiving break**
December 1	§10.3 Polar Coordinates, §10.4 Calculus in Polar Coordinates
December 3	§10.5 Conic sections
December 8	§9.1 Modeling with Differential Equations, §9.3 Separable Equations
December 15	**Final Exam December 15, 4:30-7:15 pm**

Common Policies Affecting All Courses at George Mason University

These four policies affect students in all courses at George Mason University. This Course Policy Addendum must be made available to students in all courses (see Catalog Policy AP.2.5).

Academic Standards

Academic Standards exist to promote authentic scholarship, support the institution's goal of maintaining high standards of academic excellence, and encourage continued ethical behavior of faculty and students to cultivate an educational community which values integrity and produces graduates who carry this commitment forward into professional practice.

As members of the George Mason University community, we are committed to fostering an environment of trust, respect, and scholarly excellence. Our academic standards are the foundation of this commitment, guiding our behavior and interactions within this academic community. The practices for implementing these standards adapt to modern practices, disciplinary contexts, and technological advancements. Our standards are embodied in our courses, policies, and scholarship, and are upheld in the following principles:

Honesty: Providing accurate information in all academic endeavors, including communications, assignments, and examinations.

Acknowledgement: Giving proper credit for all contributions to one's work. This involves the use of accurate citations and references for any ideas, words, or materials created by others in the style appropriate to the discipline. It also includes acknowledging shared authorship in group projects, co-authored pieces, and project reports.

Uniqueness of Work: Ensuring that all submitted work is the result of one's own effort and is original, including free from self-plagiarism. This principle extends to written assignments, code, presentations, exams, and all other forms of academic work.

Violations of these standards—including but not limited to plagiarism, fabrication, and cheating—are taken seriously and will be addressed in accordance with university policies. The process for reporting, investigating, and adjudicating violations is outlined in the university's procedures. Consequences of violations may include academic sanctions, disciplinary actions, and other measures necessary to uphold the integrity of our academic community.

The principles outlined in these academic standards reflect our collective commitment to upholding the highest standards of honesty, acknowledgement, and uniqueness of work. By adhering to these principles, we ensure the continued excellence and integrity of George Mason University's academic community.

Student responsibility: Students are responsible for understanding how these general expectations regarding academic standards apply to each course, assignment, or exam they participate in; students should ask their instructor for clarification on any aspect that is not clear to them.

Accommodations for Students with Disabilities

Disability Services at George Mason University is committed to upholding the letter and spirit of the laws that ensure equal treatment of people with disabilities. Under the administration of University Life, Disability Services implements and coordinates reasonable accommodations and disability-related services that afford equal access to university programs and activities. Students can begin the registration process with Disability Services at any time during their enrollment at George Mason University. If you are seeking accommodations, please visit https://ds.gmu.edu/ for detailed information about the Disability Services registration process. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: ods@gmu.edu. Phone: (703) 993-2474.

Student responsibility: Students are responsible for registering with Disability Services and communicating about their approved accommodations with their instructor in advance of any relevant class meeting, assignment, or exam.

FERPA and Use of GMU Email Addresses for Course Communication

The Family Educational Rights and Privacy Act (FERPA) governs the disclosure of education records for eligible students and is an essential aspect of any course. Students must use their GMU email account to receive important University information, including communications related to this class. Instructors will not respond to messages sent from or send messages regarding course content to a non-GMU email address.

Student responsibility: Students are responsible for checking their GMU email regularly for course-related information, and/or ensuring that GMU email messages are forwarded to an account they do check.

Title IX Resources and Required Reporting

As a part of George Mason University's commitment to providing a safe and non-discriminatory learning, living, and working environment for all members of the University community, the University does not discriminate on the basis of sex or gender in any of its education or employment programs and activities. Accordingly, all non-confidential employees, including your faculty member, have a legal requirement to report to the Title IX Coordinator, all relevant details obtained directly or indirectly about any incident of Prohibited Conduct (such as sexual harassment, sexual assault, gender-based stalking, dating/domestic violence). Upon notifying the Title IX Coordinator of possible Prohibited Conduct, the Title IX Coordinator will assess the report and determine if outreach is required. If outreach is required, the individual the report is about (the "Complainant") will receive a communication, likely in the form of an email, offering that person the option to meet with a representative of the Title IX office.

For more information about non-confidential employees, resources, and Prohibited Conduct, please see University Policy 1202: Sexual and Gender-Based Misconduct and Other Forms of Interpersonal Violence. Questions regarding Title IX can be directed to the Title IX Coordinator via email to TitleIX@gmu.edu, by phone at 703-993-8730, or in person on the Fairfax campus in Aquia 373.

Student opportunity: If you prefer to speak to someone confidentially, please contact one of Mason's confidential employees in Student Support and Advocacy (SSAC), Counseling and Psychological Services (CAPS), Student Health Services (SHS), and/or the Office of the University Ombudsperson.