



## Department of Mathematics

Franklin College of Arts and Sciences

UNIVERSITY OF GEORGIA

### Math 2250 – Calculus I for Science and Engineering 30106 / Fall 2018

#### Course Instructor Information

Instructor: Dr. Philipp Reiter

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Phone: (706) 542 2549

Office: Boyd 320

#### Course Meeting Information

Meetings: MWF 11.15 – 12.20 am ; Thur 12.30 – 1.45 pm

Location: Forestry Resources 1, 0303 ; Boyd (1023), 202

Website: <https://faculty.franklin.uga.edu/reiter>

Office Hours will be announced in class

UGA MATH 2250 Website: <http://www.math.uga.edu/2250>

#### Communication Preferences

I strongly prefer that you contact me in person after class and during my office hours. You are responsible for all announcements made in class regardless of whether or not you are in class.

#### Office Hours

Office hours are times that I have set aside especially for students to come and discuss math. When you come to office hours, you can arrive at any time that is convenient for your schedule (not just at the beginning). Be sure to allow yourself enough remaining time to ask questions. Here are some things we can do during office hours:

- go over problems you are stuck on
- talk about questions from class work
- discuss strategies for studying, taking exams, etc.
- talk about how you are doing in the class

If you want to speak privately during office hours (e.g. about your grades), let me know.

### General Class Information

#### Course Description

In this course we will work to develop your critical thinking skills. This course focuses on using the derivative to better understand the behavior of functions. We will discuss the limit, the derivative, and the antiderivative both conceptually and computationally. Throughout the semester, we will use calculus concepts to model and solve various problems in science and engineering, with particular emphasis on graphs, optimization problems, and basic integration problems. In these science and engineering problems, we will focus on how to transfer course knowledge to specific applied scenarios.

#### Diversity and Inclusion Statement

In this classroom, you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

(Source: modified from [https://docs.asee.org/public/LGBTQ/Diversity\\_Statement.pdf](https://docs.asee.org/public/LGBTQ/Diversity_Statement.pdf))

## **Classroom Expectations**

We will discuss mathematics together on a daily basis. These discussions are important because they provide for a richer classroom discussion, and they ensure that we all encounter different ways – correct and/or incorrect – of thinking about the material. It will be important for you to listen attentively to your peers' thinking, even if you think you already have a full solution to the discussion problem. I expect you to respond respectfully and carefully to your peers' comments. When you are working in groups, I expect you to help your group members to all work at the same pace; it will be important for you to keep your peers informed about the choices you are making, and for you to check in with them to make sure they follow your thinking and are ready to move on.

## **Program-Level Learning Outcomes**

At the end of the degree program, a successful student will be able to apply the methods of calculus to set up and solve real world problems in science and engineering.

## **Student Learning Outcomes**

At the end of the semester, a successful student will be able to:

1. Calculate and interpret basic trends, rate, and accumulation using the limit, the derivative, and the integral, respectively.
2. Use a function's graph to:
  - a. Identify increasing/decreasing behavior and critical numbers of the first or second derivative of the function
  - b. Identify extrema
  - c. Determine limits
  - d. Identify points of continuity/discontinuity
  - e. Identify asymptotes
  - f. Identify points where function is/is not differentiable
3. Use information (a formula or table and/or first or second derivative, etc.) about a function to predict:
  - a. Behavior of the function and/or its first or second derivative
  - b. Extrema
  - c. Limits
  - d. Points of continuity/discontinuity
  - e. Asymptotes
  - f. Identify points where function is/is not differentiable
4. Apply calculus to solve an application problem by selecting an appropriate model, identifying an appropriate calculus technique, using the calculus technique on the model to solve the problem, and interpreting the solution in context.

## **Course Prerequisite**

MATH 1113 or permission of department

## **Tutoring**

The Division of Academic Enhancement offers free tutoring. Information is available at <http://tutor.uga.edu> and <http://tutor.uga.edu/arc/tutoring>. Moreover, the math department runs study halls in Boyd staffed by graduate students.

## Assignments and Grading

### Assignments

Students will be evaluated in the following areas:

**Course Grade** Your numeric grade will be calculated using the following percentages:

Midterm Exams	60% total (each exam counts 15%)
Final Exam (Mass Exam, Cumulative)	20%
Homework	10%
In-class activities (quizzes)	10%
Total	100%

### Midterm Exams

Our midterm exams will be traditional paper-and-pencil exams given during class time. Most questions will be free response, although we may occasionally have some multiple choice and/or true/false questions.

No makeup midterms will be given, and these exams may not be repeated. If you are absent from a scheduled midterm, and your absence is excused (generally, this requires a medical or legal explanation, with supporting documentation), the grade for the missing exam will be replaced with your final exam grade. If you know in advance that you cannot be in attendance for a particular midterm, discuss this with the instructor as early as possible.

Tentative midterm exam dates are listed below; any changes to the testing schedule will be announced by the instructor in class.

Midterm 1: September 6

Midterm 2: October 4

Midterm 3: November 1

Midterm 4: November 29

### Final Exam

In this course we have a mass final exam. The final exam is comprehensive, meaning that it covers everything from the whole semester. Students from all sections of MATH 2250 take the same exam at the same time, in a location determined by the registrar (location TBD in November). This semester, the mass final exam for MATH 2250 is on Thursday, December 6, from 7 p.m. to 10 p.m. If you have three or more exams scheduled during a 24-hour period, you are eligible to request a rescheduled exam; mass exams are to be rescheduled first if possible. See the official university exam conflict policy for details: <https://curriculumsystems.uga.edu/curriculum/finalExamConflicts>

### Quizzes

I will use quizzes to gauge your progress in learning the material. After we cover a topic, you should be ready for a quiz on that topic. I will drop your lowest in-class quiz grade. Make-up quizzes will not be given. If, on a quiz day, you have an excused absence with valid documentation, I will drop an additional quiz grade for that excused absence.

## Homework

The purpose of homework is for you to continue developing your understanding of the material. Struggle is a part of the learning process, and I hope that you will wrestle with problems you do not understand, and that you will grow and learn through this process. Please come and get help during office hours if you have questions.

This course has a free online homework system called WeBWork. You can access the WeBWork system online. Your username for WebWork is your UGA myID, and your password is your nine digit 810 or 811 student number. For example, if your UGAMail address is xyz30602@uga.edu and your student number is 8114567890, then your username is xyz30602 and your password is 811456789. To access WeBWork off campus, you will need a VPN; here is a link to information about using VPN with WeBWork: <http://www.math.uga.edu/webwork/VPN>

## Letter Grades

Letter grades will be assigned using the following scale:

92-100	89-91	87-88	82-86	79-81	77-78	72-76	69-71	60-68	<60
A	A-	B+	B	B-	C+	C	C-	D	F

## Tentative Course Outline

The schedule and assignments in this course are subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better student learning. Pre-class assignments are video assignments that are to be completed *prior to* the specified class meeting.

MATH 2250 Tentative Schedule					
Week	Month	Date	Day	Section	Topic
1	Aug	13	M		Course Intro (Icebreaker/Syllabus/Precalc review)
	Aug	15	W	2.1	Rates of Change and Tangents to Curves
	Aug	16	R	2.2	Limit of a function/limit laws
	Aug	17	F	2.4	One-sided limits *drop-add ends
2	Aug	20	M	Flex	Limits - Instructor Choice (2.2/2.4)
	Aug	22	W	2.5	Continuity
	Aug	23	R	2.6	Limits Involving Infinity/Asymptotes
	Aug	24	F	2.6	Limits Involving Infinity/Asymptotes
3	Aug	27	M	3.1	Tangents and the Derivative at a Point
	Aug	29	W	3.2	The Derivative as a Function
	Aug	30	R	3.3	Differentiation Rules
	Aug	31	F	3.3	Differentiation Rules
4	Sept	3	M		Labor Day Holiday - no classes
	Sept	5	W	Rev	Review (Catch up if needed)
	Sept	6	R	Exam	Exam 1: 2.1-3.2 (Approx) *can include 3.3
	Sept	7	F	3.4	Derivative as Rate of Change
5	Sept	10	M	3.5	Derivatives of Trig Functions
	Sept	12	W	3.6	The Chain Rule
	Sept	13	R	Flex	Differentiation Rules - Instructor Choice (3.3-3.6)
	Sept	14	F	3.7	Implicit Diff
6	Sept	17	M	3.8	Derivatives of Inverse Functions, Logs

	Sept	19	W	3.8	Derivatives of Inverse Functions, Logs
	Sept	20	R	3.9	Derivatives of Inverse Trig Functions
	Sept	21	F	3.ten	Related Rates
7	Sept	24	M	3.ten	Related Rates
	Sept	26	W	3.ten	Related Rates
	Sept	27	R	3.11	Linearization and Differentials
	Sept	28	F	4.1	Extreme Values
8	Oct	1	M	4.1	Extreme Values
	Oct	3	W	Rev	Review (Catch up if needed)
	Oct	4	R	Exam	Exam 2: 3.3-3.11 (Approx)
	Oct	5	F	4.2	Mean Value Theorem
9	Oct	8	M	4.3	Monotonic Functions and the First Derivative Test
	Oct	10	W	4.3	Monotonic Functions and the First Derivative Test
	Oct	11	R	4.4	Concavity and Curve Sketching
	Oct	12	F	4.4	Concavity and Curve Sketching
10	Oct	15	M	4.5	Indeterminate Forms and L'Hopital's Rule
	Oct	17	W	4.5	Indeterminate Forms and L'Hopital's Rule *withdrawal deadline
	Oct	18	R	Flex	Curve Sketching - Instructor choice (4.2-4.5)
	Oct	19	F	4.6	Applied Optimization
11	Oct	22	M	4.6	Applied Optimization
	Oct	24	W	4.6	Applied Optimization
	Oct	25	R	4.7	Newton's Method (Optional)
	Oct	26	F		Fall break – no classes
12	Oct	29	M	4.8	Antiderivatives
	Oct	31	W		Review
	Nov	1	R		Exam 3: 4.1-4.7 (approx)
	Nov	2	F	4.8	Antiderivatives
13	Nov	5	M	5.1-5.2	Areas/Finite Sum Estimates, Sigma Notation, Limits of Finite Sums
	Nov	7	W	5.1-5.2	Areas/Finite Sum Estimates, Sigma Notation, Limits of Finite Sums
	Nov	8	R	5.3	The Definite Integral
	Nov	9	F	5.3	The Definite Integral
14	Nov	12	M	5.4	The Fundamental Theorem of Calculus
	Nov	14	W	5.4	The Fundamental Theorem of Calculus
	Nov	15	R	5.5	Indefinite Integrals and Substitution
	Nov	16	F	5.6	Substitution and Areas Between Curves
15	Nov	19	M		Thanksgiving Break – No classes
	Nov	21	W		
	Nov	22	R		
	Nov	23	F		
16	Nov	26	M	5.6	Substitution and Areas Between Curves
	Nov	28	W		Review
	Nov	29	R		Exam 4: 4.8, 5.1-5.6 *can stop at 5.5 if needed
	Nov	30	F		Flex/Review (how to study for final exams)
17	Dec	3	M		Flex/Review

	Dec	4	Tue!		Flex/Review *Friday class schedule, last class day
	Dec	5			*reading day
	Dec	6			*Mass Final Exam – Dec 6 from 7 p.m. to 10 p.m.
	Dec	7			

## Classroom Policies

### Course Materials

The textbook is Hass, Weir, Thomas, University Calculus, Early Transcendentals, Third Edition, ISBN 9780321999580. You are not required to purchase the textbook, although it may be valuable to you because I will recommend textbook problems for additional practice. **You may use a TI-30XS Multiview in class.** No other calculators will be allowed, and sharing of calculators is not permitted. I recommend having a three-ring binder, a pencil, and notebook paper for use in class. (\*See the Electronics Policy below.)

### Announcements Policy

I will make most announcements in class; I might send others to your UGA email. You are responsible for the content of all announcements, even if you miss class or fail to check your UGA email.

### Electronics Policy

Laptops\*, cell phones, tablets\*, smart watches, etc., may not be used in class. You may not have a smart watch or other personal electronic device on your person during a quiz or exam; these devices must be stored in a backpack or purse. Your personal electronic devices must be in “silent” mode during class; a ringing or vibrating device disrupts the classroom experience. I understand that there may be times when you need to be connected (childcare issues, family emergencies, etc.). If such a situation arises, please step outside and address these as needed. If you repeatedly violate this policy, you will be asked to leave the room immediately. No exceptions.

\* I will make one possible exception to this policy. If you are legitimately using one of these devices for note taking purposes, you must request permission from me in person. If granted, you may be required to email your notes to me at the end of every class. I reserve the right to revoke permission if I feel this policy is being abused or becomes disruptive to others.

### Participation Policy

A student who is not fully engaged in class activities is considered absent for the day. Students are allowed no more than 3 unexcused absences. On the fourth unexcused absence, a student may be withdrawn from the course with a grade of W before midpoint, F after midpoint. Do not regard these 3 allowed absences as "personal free days". These are only to be used in cases of personal or family emergencies. In some cases, verification may be required. I will work with any student who has a documented emergency, so please let me know as soon as possible if something is going on. Social functions, work, weddings, etc. do not count as excused absences, but documented medical emergencies and active duty military service are excused absences. Let me know if you will miss class for an excused absence; if so, I may allow you to complete in-class assignments early. In the event that the university cancels our class, any assignments scheduled to be due that class day will be due the next time the class meets.

## **Deadline Policy**

Any work that is not submitted on time will receive a grade of zero. You are responsible for submitting assignments on time, even following an absence (excused or unexcused).

## **Academic Honesty Policy**

As a University of Georgia student, you have agreed to abide by the University's academic honesty policy, "A Culture of Honesty," and the Student Honor Code. All academic work must meet the standards described in "A Culture of Honesty" found at: <https://ovpi.uga.edu/academic-honesty/academic-honesty-policy>. Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Questions related to course assignments and the academic honesty policy should be directed to the instructor.

## **Specific Academic Honesty Guidelines for This Course**

You may not discuss a graded assignment with other students until that assignment has been graded and returned to you, unless you have been given explicit permission to do so. You are encouraged to discuss homework with others. The following are examples of academic dishonesty and are prohibited in this course:

- getting an answer by finding a solution to a similar problem and changing the numbers to your own numbers without thinking through (and working through) the steps on your own
- getting someone (or an app) to work a problem for you and submitting the work as your own
- using unauthorized materials during a testing situation (e.g. midterms) including cheat sheets, the internet, another person's test paper, an unauthorized calculator, etc.
- having a cell phone or smart watch accessible during a testing situation, even if you are not using it to find problem solutions

This is not an exhaustive list; it is meant to give you an idea of prohibited activities.

## **General Operating Policies and Procedures**

### **FERPA Notice**

The Federal Family Educational Rights and Privacy Act (FERPA) grants students certain information privacy rights. See the registrar's explanation at <http://apps.reg.uga.edu/FERPA/>

### **Course Evaluations**

I encourage you to complete the online evaluation near the end of the semester. Student evaluations of teaching are used by university administrators to evaluate instructional faculty. I also take your feedback seriously; note that it is delivered anonymously and is not visible to me until after I have submitted all final course grades.

### **Office of Student Care and Outreach**

If you have a personal crisis during the semester, you will want to contact the Office of Student Care and Outreach so that they can support you: <http://sco.uga.edu/sco/services-students>

### **Accessibility Statement**

If you anticipate issues related to the format or requirements of this course, please meet with me. I would like us to discuss ways to ensure your full participation in the course. If you determine that formal, disability-related accommodations are necessary, it is very important that you be registered with the Disability Resource Center located in Clark Howell Hall (Voice: 706-542-8719 or TTY: 706-542-8778 or Web: <http://drc.uga.edu>) and notify me of your eligibility for reasonable accommodations. We can then plan how best to coordinate your accommodations. If you have a

documented disability, I strongly encourage you to register now with the DRC so you have access to any accommodations that you may need throughout the semester.

**Disclaimer** The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary. It is the responsibility of the student to seek clarification of the grading policy and/or course requirements and procedures from the instructor.