

MATH2250 - Calculus I for Science and Engineering

1. COURSE INFORMATION

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Office hours: MWF 10:00-12:00

Book: Hass/Weir/Thomas, University Calculus, Third Edition, Early Transcendentals

2. PREREQUISITES

Students are expected to have a solid foundation in high-school algebra and trigonometry, equivalent to that offered in the MATH 1113 precalculus course, in order to enroll in the course.

3. COURSE SCHEDULE

Below is an outline of the topics covered in the course and the corresponding sections in the textbook.

Topics	Sections	
Limits as a concept.	2.1	
One-Sided Limits.	2.4	
Limit Laws.	2.2	
Limits at infinity.	2.6	
Continuity.	2.5	
Average rates of change. Derivatives from first principles.	3.1-3.2	
First Test	2.1-2.6, 3.1-3.2	02/06/2018
Product, chain and quotient rules.	3.3, 3.6	
Position, velocity and acceleration.	3.4	
Derivatives of trigonometric functions.	3.5	
Implicit Differentiation.	3.7	
Derivatives of Inverse and Logarithmic Functions.	3.8	
Derivatives of Inverse Trig Functions.	3.9	
Related Rates	3.10	
Linearization	3.11 + extra	
Newton's Method.	4.7	
Second Test	2.1-2.6, 3.1-3.11, 4.7	03/06/2018
Maxima and Minima, Mean Values.	4.1-4.2	
The First and Second Derivative Tests.	4.3-4.4	
L'Hôpital's rule. Optimization problems.	4.5-4.6	
Antiderivatives and Differential Equations	4.8	
Sums of natural numbers, squares.	5.2	
Sums of cubes. Sigma notation.	5.2	
Third Test	2.1-2.6, 3.1-3.11, 4.1-4.8	04/17/2018
Definite Integral. The fundamental theorem of calculus.	5.3-5.4	
Indefinite Integral. u -substitution	5.5-5.6	
Final Exam probably in MLC	(all course material)	05/03/2018

4. DISCLAIMER

The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.

5. COURSE GOALS

Students will develop computational fluency with differentiation and integration. Students will learn to model and solve optimization problems using derivatives. Students will also be introduced to the basics of integration and learn related methods of solving integrals.

6. PRINCIPAL COURSE ASSIGNMENTS

This course has a substantial workload. Student responsibilities include:

- Attendance to all scheduled class meeting times.
- Weekly quizzes based on the previously covered material.
- Solving problems via the online *WebWork* interface
- Three written assignments.
- Three midterm examinations
- One (common) final exam, three hours in length.

It has been shown that working as part of a study group has been beneficial to learning and retaining studied material. **Form a group early** and make use of all of the available resources, including office hours.

For this class, we're using a web-based homework system called **WebWork**. The login link is

https://webwork.math.uga.edu/webwork2/Math2250_Iliev_S18/

Your username comes from your uga.edu email address. If your email address is `jones@uga.edu`, then your username is `jones`. Your password is your nine-digit 810 number, without spaces.

WebWork lets you try the homework questions as many times as you like until the assignment is due. The system will tell you whether or not you have the right answer. This lets you correct your work immediately. After the assignment's due date, the system will show you the correct answer for each problem when you try it (but your answers won't be scored). Since the system shows you the answers immediately after the due time, I can't give extensions on homework. You may complete assignments in advance if you wish.

You are welcome to work together on **WebWork** problems, but be warned: **the problems are a little different for each student**, so copying other students answers won't work. It is certainly possible to solve many of the homework problems using online tools such as Wolfram—Alpha. You should use these tools with care. If you are stuck on a problem, using the "Show steps" option on Alpha can give you good information about how to solve a problem. On the other hand, if you become dependent on tools like Alpha, you are likely to do very poorly on the exams.

When you first login to **WebWork**, you'll see three buttons on the left. Use the "Change Email" and the "Change Password" button to set your preferred identification. Then try "Begin Problem Sets" to see how the system works. You can select a set and print it out in PDF format to work out the problems on paper if you like. Your problems will be the same when you login again to enter the answers.

7. GRADING POLICY

Your overall grade is computed according to the following breakdown:

- (1) 10% for your quiz scores
- (2) 10% for your **WebWork** scores
- (3) 5% for each of the three assignments
- (4) 12% for each of the three tests
- (5) 29% for the final exam.

After grades are calculated for each student using these weights, the instructor will rank the students by average and determine thresholds for grades of A, B, C, D, and F. As a guideline, these will be around 90%, 80%, 70%, and 60%, respectively. Though improvement and other circumstances are taken into account in deciding thresholds for letter grades, students with a higher numerical average almost always receive higher letter grades than those with lower numerical averages.

As further guidelines, the standards for each letter grade are as follows:

A: The student has computational mastery of the course material and errors are very rare. They can set up and solve non-routine word problems. The student understands the theoretical aspects of the course and can apply the main theorems of the course, such as the Intermediate Value Theorem or Mean Value Theorem. The student shows effective communication skills in writing up problem solutions, explains them clearly, and draws correct conclusions from them.

B: The student has computational expertise, but may make occasional errors. They can set up and solve standard word problems, and understand the theoretical basis of the course well enough (for instance) to distinguish between differentiability and continuity. The students technical communications in writing up solutions are mathematically coherent, but the explanations are sometimes unclear or confusing.

C: The student demonstrates basic computational skills, has some conceptual understanding of the meaning of the derivative and integral, and can do most routine word problem. The students technical communications are only approximately correct, but the explanations show understanding of the situation.

D: The student can do routine calculations, including a moderate chain rule application, and can find the equation of the tangent line, but struggles to set up a routine word problem. The students technical communications address the assignments, but may not allow you to solve the problem in practice.

8. ATTENDANCE POLICY

Students are expected to attend class regularly. Students who miss more than 6 classes may be withdrawn from the course by the instructor.

9. ACADEMIC HONESTY

In this class, we maintain a cooperative culture of honesty. This means that you are responsible for your own honesty, and for reporting the academic honesty violations of others. 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: www.uga.edu/honesty. 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.

It is perfectly acceptable to work on homework problems in groups in this course. However, the help you should get from your fellow students should enable you to complete the problem on your own. Recruiting another student to complete the homework for you, or to simply provide answers to the problems, is a violation of the honesty policy.

10. REQUIRED COURSE MATERIAL

The companion textbook for this class is an excellent resource for practice problems and further studies. The material covered in this course is contained in Chapters 2, 3, 4 and part of Chapter 5 of the course textbook. Some version of the book is required, so you're welcome to use the first or second edition, although all suggested problems will refer the third edition.

11. MAKE-UP EXAMINATIONS

No makeup examinations will be given in the course. If you are absent from a scheduled exam, and your absence is excused (with supporting medical or legal documentation), the portion of the course grade assigned the missed exam will be divided equally between the other exams (including the final exam). Students with an excused absence from multiple exams will be withdrawn or given a grade of "T".