

## MATH 191: CALCULUS I (FALL 2013)

**Course number:** MAT 191-04

**Course title:** Calculus I

**Credits:** 3

**Meetings:** MWF 9:00–9:50 AM, PETT 223

**Prerequisites:** The prerequisite for entering MAT 191 is to achieve a grade of at least a C in MAT 151, a C- is not enough. This may be substituted by an acceptable score on the mathematics placement test. You are responsible for all of the material from Chapter 1 of the textbook. It will not be covered in class. Be sure that you read this chapter and fill in any gaps in your knowledge by testing yourself on the exercises there; some answers are in the back of the book.

**Instructor information:**

Instructor: Dr. Dan Yasaki    [d\\_yasaki@uncg.edu](mailto:d_yasaki@uncg.edu)

Homepage: [http://www.uncg.edu/math/faculty/d\\_yasaki/teaching.html](http://www.uncg.edu/math/faculty/d_yasaki/teaching.html)

Office Hours (146 Petty): MWF 11:00–noon<sup>1</sup>

**For whom planned:** MAT 191 is a GE core course (GMT). It is the first course in the Calculus sequence.

**Catalog description:** Limits and introductory differential calculus of the algebraic and transcendental functions of one variable.

**Student learning outcomes:** MAT 191 provides students an opportunity to appreciate certain concepts in fundamental mathematics, especially functions, limits, and differential calculus. The emphasis is on abstract reasoning, not routine manipulations, and this course satisfies the Mathematics (GMT) requirement of the General Education Program. Upon successful completion of this course, students will achieve the following learning objectives. The student will be able to:

- employ problem solving strategies in fundamental mathematics that go beyond routine mathematics operations and data manipulation,
- reason in mathematical systems,
- formulate and use mathematical models and apply mathematical concepts effectively to solve real-world problems,
- evaluate decisions based on mathematically valid principles, and
- communicate mathematical solutions clearly and effectively.

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This document was last modified on November 15, 2013.

<sup>1</sup>I will be out of town the week of 9/16 for a conference. Office hours cancelled that week. Email all questions.

**Teaching methods and assignments for achieving learning outcomes:** Abstract reasoning is a part of every lesson and homework in this course. The student, through regular and frequent attention to the lessons and homework questions, will achieve the learning objectives delineated in the preceding section. Multiple homework questions are assigned for each lesson and are designed to reinforce the learning objectives. The student will demonstrate achievement of learning objectives through satisfactory completion of graded assignments and tests. The questions on graded assignments and tests are designed to evaluate specific parts of the learning objectives and in this way the grade reflects the attainment of the objectives.

**Evaluation and grading:** Semester averages are rounded to the nearest point, and letter grades are assigned on a 10 point scale.

A+ : 97–100	B+ : 87–89	C+ : 77–79	D+ : 67–69	
A : 93–96	B : 83–86	C : 73–76	D : 63–66	F : 0 – 59
A– : 90–92	B– : 80–82	C– : 70–72	D– : 60–62	

The following table is the breakdown of how much credit each assignment category is worth towards your final grade:

- Homework assignments (10%): Due dates are posted on our website. See Table 3 for exercise list.
- Quizzes (10%): A short quiz each Friday measuring your mastery of concepts since the previous quiz.
- Four tests (12.5% each for a total of 50%): See Table 1.
- Final exam (30%): See Table 1.

The lowest homework and lowest quiz grade will be dropped to account for any unforeseen emergencies that cause you to miss a deadline. The lowest test score will be replaced with the final exam score if the latter is higher.

**Required text:**

Thomas' Calculus Early Transcendentals, 12th edition

**Final examination:** The Final Exam is cumulative, covering topics from Chapters 2–4 of the textbook. The exam is three hours long and will be given on Monday, December 9, 2013 at 8:00 AM.

**Academic Integrity Policy:** Each student is required to sign the Academic Integrity Policy on all major work submitted for the course.

*I have abided by the UNCG Academic Integrity Policy on this assignment.*

Signature \_\_\_\_\_ Date \_\_\_\_\_

More information can be found at

<http://sa.uncg.edu/handbook/academic-integrity-policy/>.

**Attendance Policy:** Attendance is mandatory. Two consecutive absences or four total absences during the semester may result in a failing grade, regardless of semester average. Attendance will be measured using quizzes.

TABLE 1. Calendar

Week	Monday	Wednesday	Friday
8/19	2.2	2.3	Review
8/26	2.4	2.5	2.6
9/ 2	<i>Labor Day</i>	Review	<b>Test 1</b>
9/ 9	2.1	3.1	Review
9/16	3.2	3.3	Review
9/23	3.5	3.6	Review
9/30	<b>Test 2</b>	3.4	3.7
10/ 7	3.8	3.9	Review, <i>Drop date</i>
10/14	<i>Fall Break</i>	4.1	4.2
10/21	4.3	4.4	Review
10/28	<b>Test 3</b>	3.10	Review
11/ 4	3.11	4.5	Review
11/11	4.6	4.7	Review
11/18	<b>Test 4</b>	Review 1	Review 2
11/25	Review 3	<i>Thanksgiving break: 11/27, 11/29</i>	
12/ 2	Review 4, <i>Last class</i>		
12/ 9	<b>Final exam: Monday, 12/9 8:00 - 11:00 AM</b>		

**Additional information:**

- (1) Students with Disabilities: If you have a documented disability and wish to discuss academic accommodations, please contact me as soon as possible. You are responsible for contacting the OARS in 215 EUC (334-5440, <http://ods.dept.uncg.edu/>) and for arranging the necessary forms for me to fill out and sign. Without these forms the services provided by the OARS will not be available. OARS cannot schedule or reschedule tests without consent from the instructor.
- (2) Assignments Policy:
  - (a) Assignments are due at the beginning of class. Late assignments will be accepted as late as 5 PM on the due date for half credit and not accepted after that.
  - (b) Written assignments must be
    - (i) legible.
    - (ii) stapled (if more than one page).
    - (iii) not torn from a spiral bound notebook.
- (3) Absence Policy: You are responsible for all missed material. Any missed assignment, test, or final exam will result in a score of 0. Make-up tests and final exam will be given only if you receive prior approval for a valid excuse by contacting me at least one week in advance.
- (4) Copyright Policy: Selling or purchasing notes from classes for commercial gain is a violation of the UNCG Copyright Policy.

<http://policy.uncg.edu/copyright/>

TABLE 2. Topical outline

Section	Material covered
<b>2.</b>	<b>Limits and Continuity</b>
2.1	Rates of Change and Tangents to Curves
2.2	Limit of a Function and Limit Laws
2.3	The Precise Definition of a Limit
2.4	One-Sided Limits
2.5	Continuity
2.6	Limits Involving Infinity; Asymptotes of Graphs
<b>3.</b>	<b>Differentiation</b>
3.1	Tangents and the Derivative at a Point
3.2	The Derivative as a Function
3.3	Differentiation Rules
3.4	The Derivative as a Rate of Change
3.5	Derivatives of Trigonometric Functions
3.6	The Chain Rule
3.7	Implicit Differentiation
3.8	Derivatives of Inverse Functions and Logarithms
3.9	Inverse Trigonometric Functions
3.10	Related Rates
3.11	Linearization and Differentials
<b>4.</b>	<b>Applications of Derivatives</b>
4.1	Extreme Values of Functions
4.2	The Mean Value Theorem
4.3	Monotonic Functions and the First Derivative Test
4.4	Concavity and Curve Sketching
4.5	Indeterminate Forms and L'Hôpital's Rule
4.6	Applied Optimization
4.7	Newton's Method

Any student who sells notes taken in class for commercial gain, or who purchases notes taken by another student for commercial gain, is in violation of this policy and, by extension, is committing a violation of the Student Code of Conduct.

<http://sa.uncg.edu/handbook/student-code-of-conduct/>

- (5) Email Policy: All email correspondence should be made using your UNCG email account. You must check your email regularly for updates and announcements.
- (6) Calculators are not allowed on tests, quizzes, or final exam. You may need them for arithmetic on homework exercises.

TABLE 3. Exercise list

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Section	Exercises
<b>2.</b>	<b>Limits and Continuity</b>
2.1	(1, 2, 4, 5, 6, 8, 10, 12, 14, 17, 20)
2.2	(2, 4, 6, 8, 10, 12, 18, 20, 22, 24, 26, 28, 32, 36, 48, 54, 56, 64, 80, 81)
2.3	(2, 4, 6, 12, 16, 18, 20, 24, 32, 36, 46, 49, 52, 56)
2.4	(2, 4, 6, 10, 18, 22, 30, 36, 44, 46)
2.5	(2, 4, 6, 8, 10, 14, 16, 18, 20, 26, 30, 32, 40, 44, 48, 53, 55)
2.6	(2, 4, 6, 10, 12, 14, 16, 18, 20, 22, 24, 28, 38, 40, 42, 44, 58, 64, 66, 68, 70, 80, 90)
<b>3.</b>	<b>Differentiation</b>
3.1	(2, 4, 6, 8, 10, 12, 16, 18, 22, 24, 28, 30)
3.2	(2, 4, 6, 8, 10, 14, 22, 24, 28, 30, 32, 34, 44, 46, 48, 53)
3.3	(2, 4, 6, 8, 10, 12, 14, 16, 18, 26, 28, 30, 54, 64, 70, 78)
3.4	(2, 4, 6, 8, 10, 18, 26)
3.5	(2, 4, 6, 8, 10, 12, 18, 24, 30, 38, 48, 50, 54, 58)
3.6	(2, 4, 6, 8, 10, 14, 20, 22, 26, 36, 38, 52, 58, 62, 68, 80, 82, 88, 92)
3.7	(2, 4, 6, 10, 14, 16, 20, 30, 32, 34, 43, 50)
3.8	(2, 4, 6, 12, 14, 20, 28, 32, 44, 50, 64, 66, 68, 70, 74, 94)
3.9	(2, 4, 10, 12, 14, 16, 18, 20, 22, 24, 26, 34, 52, 54)
3.10	(2, 4, 6, 8, 10, 12, 20, 22, 28, 32, 40)
3.11	(2, 4, 6, 8, 10, 12, 20, 22, 24, 26, 32, 40, 44, 46, 48, 52, 54)
<b>4.</b>	<b>Applications of Derivatives</b>
4.1	(2, 4, 6, 9, 12, 14, 16, 18, 20, 22, 24, 26, 30, 37, 42, 44, 54, 58, 66, 72, 78)
4.2	(2, 6, 8, 10, 12, 14, 16, 22, 26, 34, 40, 44, 48, 52, 54)
4.3	(2, 6, 10, 14, 16, 20, 22, 36, 44, 70)
4.4	(2, 6, 8, 10, 12, 14, 24, 40, 52, 58, 60, 62, 79, 82, 90, 104, 106)
4.5	(2, 4, 8, 10, 12, 24, 30, 46, 48, 52, 56, 66, 68, 76, 79)
4.6	(2, 4, 8, 12, 22, 24, 38, 56)
4.7	(2, 4, 22, 30)

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