

## Syllabus

### *CALCULUS I*

MAT 254

Fall 2010

**Instructor:** John DeLucia

**Office Hours:** By Appointment

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**Prerequisite:** Precalculus, MAT 186

**Required Text:** Calculus, 6<sup>th</sup> ed., by James Stewart  
Publisher: Thomson/Brooks/Cole

**Supplementary Materials:** Graphing Calculator (TI-83, 84, or 89 recommended)

**Course Description:** This is a first course in the Calculus sequence intended for students who plan on majoring in mathematics, physical sciences or engineering technology. The topics include: rates of change, limits, continuity, differentiation of algebraic, trigonometric, exponential and logarithmic functions, differentials, applications of differentiation, definite and indefinite integrals, and applications of integration.

**Grading Policy:** Your grade will be determined in the following manner:

1. *Tests.* There will be three tests given throughout the semester. The tests will be worth 60% of the final grade. Makeup tests will be available if prior arrangements are made with the instructor.
2. *Final Exam.* A comprehensive final exam will be given at the end of the semester. The exam will be worth 25% of the final grade.
3. *Homework.* Homework will be assigned throughout the semester and I will collect and grade these assignments occasionally. The homework will be worth 15% of the final grade.

Grade	A 93 – 100	B+ 87 – 89	C+ 77 - 79	D+ 67 – 69	F 59 or below
Equivalents:	A- 90 – 92	B 83 – 86	C 73 – 76	D 63 – 66	
		B- 80 – 82	C- 70 – 72	D- 60 – 62	

**Attendance:** Regular class attendance is expected and attendance is mandatory for tests and the final exam.

**Support Services:** The tutoring center offers free services to all TRCC students. Additionally, the textbook has a web site and supplemental materials.

**Disabilities Statement:** If you are a student with a disability and believe that you will need accommodations for this class, it is your responsibility to contact the Disabilities Counseling Services at 383-3240. To avoid any delay in the receipt of accommodations, you should contact the counselor as soon as possible. Please note that I cannot provide any accommodations based upon your disability until I have received notification from the disabilities counselor.

**Academic Integrity:** You are expected to do your own work on exams, tests, and quizzes. You may receive help and work collaboratively on homework provided you understand the work you submit. I will enforce college policies on academic dishonesty.

**Tentative Course Outline:**

<u>Date</u>	<u>Sections Covered</u>
8/26	1.1, 1.2, 1.3, 1.4, 2.1, 2.2
9/02	2.3, 2.5, 3.1
9/09	3.2, 3.3, 3.4
9/16	3.5, 3.6, Review
9/23	<b>Test # 1</b> , 3.7, 3.8
9/30	3.9, 4.1, 4.2
10/07	4.3, 4.4, 4.5
10/14	4.6, 4.7, 4.8, Review
10/21	<b>Test # 2</b> , 4.9, 5.1
10/28	5.2, 5.3, 5.4
11/04	5.5, 6.1, 6.2
11/11	<i>No Classes – Veteran’s Day</i>
11/18	7.1, 7.2, 7.3
11/25	<i>No Classes – Thanksgiving Break</i>

12/02	7.4, 7.5, Review
12/09	<i>Test #3</i> , Review for final exam
12/16	<b><i>FINAL EXAM</i></b>

**Learning Outcomes:** After successful completion of this course, the student will be able to:

1. Evaluate a function at any given value.
2. Find the domain and range of a function.
3. Graph functions using tables and transformations, including piece-wise defined functions.
4. Determine whether functions are even, odd, or neither.
5. Find the composite of two functions and express a function as the composition of two or more functions.
6. Find the limit of a function using a graph, a table of values or algebra, including limits involving infinity.
7. Determine whether a given function is continuous and find points of discontinuity.
8. State and apply the Intermediate Value Theorem.
9. Use the definition of the derivative to differentiate a function.
10. Sketch the graph of the derivative given the graph of a function.
11. Understand graphical and physical interpretations of the derivative.
12. Use differentiation formulas and the Chain Rule to find the first and higher order derivatives of algebraic, trigonometric, inverse, exponential and logarithmic functions.
13. Find the equation of the tangent line to the graph of a function at a specified point.
14. Find the derivative of an equation using implicit differentiation.
15. Solve applied problems involving rates of change.
16. Solve related rate problems.
17. Find the differential and the linear approximation of a function.
18. Find the critical numbers of a function and use them to find the maximum and minimum values of the function on a closed interval.
19. State and apply Rolle's Theorem and the Mean Value Theorem.
20. Use the first and second derivative of a function to find the shape of the graph, show where the function is increasing and decreasing, find relative extrema, determine where it is concave up and concave down, and find inflection points.
21. Sketch the graph of a function showing all critical points, inflection points, and asymptotes.
22. Solve optimization problems.
23. Find antiderivatives.
24. Know the definition of a definite integral and its relationship to area and distance problems.
25. Understand and apply the Fundamental Theorem of Calculus.
26. Evaluate definite and indefinite integrals using basic integration formulas and the substitution method.
27. Use integration to find the area of the region between two curves.

**Homework:** This is a guide only. Assignments may vary.

Chapter 1:

- 1.1 p.20 #1, 5, 7, 21, 23, 27, 29, 35 – 43 odd, 61 – 69 odd
- 1.3 p.43 #1, 3, 5, 11, 17, 29, 31, 33, 41, 45

Chapter 2:

- 2.1 p.65 #5, 7
- 2.2 p.75 #5, 7, 9, 15, 21, 25, 35
- 2.3 p.85 #11 – 27 odd, 35, 40, 46
- 2.5 p.105 #3, 5, 7, 17, 19, 37, 39, 41, 47, 53

Chapter 3:

- 3.1 p.119 #3, 5, 7, 11, 13, 17, 21
- 3.2 p.131 #1 – 11 odd, 17, 19, 33, 35, 39, 41
- 3.3 p.144 #1 – 19 odd, 23, 27, 29, 31, 35, 39, 53 – 61 odd, 65, 71, 75, 83
- 3.4 p.154 #1 – 15 odd, 25, 33 – 43 odd, 44
- 3.5 p.161 #1 – 17 odd, 21, 23, 29, 31, 37, 53, 63, 75
- 3.6 p.169 #5, 7, 11, 27, 35
- 3.7 p.179 #1, 5, 7, 10, 15, 18, 28
- 3.8 p.186 #3, 5, 7, 13, 17, 27
- 3.9 p.193 #1, 3, 7, 11, 13, 15, 17, 23, 31, 41

Chapter 4:

- 4.1 p.211 #3, 5, 21, 29, 33, 39, 45, 47, 51, 53
- 4.2 p.219 #1, 3, 5, 11, 13
- 4.3 p.227 #1, 5, 7, 9, 11, 13, 27, 29, 35, 41
- 4.4 p.240 #3, 9 – 19 odd, 22, 23, 25, 33, 43
- 4.5 p.248 #1, 5, 9, 27, 47
- 4.7 p.262 #5, 11, 12, 13, 24, 31
- 4.8 p.273 #5, 7, 29
- 4.9 p.279 #1 – 17 odd, 21 – 39 odd, 51, 53, 57

Chapter 5:

- 5.1 p.298 #5, 11, 13
- 5.2 p.310 #5, 11, 17, 19, 33, 35, 36, 39, 41, 42, 47, 48, 49, 50
- 5.3 p.321 #3 – 11 odd, 19 – 33 odd
- 5.4 p.329 #5 – 13 odd, 19 – 35 odd, 43, 45, 49, 55
- 5.5 p.338 #1 – 13 odd, 17, 19, 21, 23, 27, 35, 37, 39, 43

Chapter 6:

- 6.1 p.352 #1 – 21 odd

Chapter 7:

- 7.1 p.391 #5, 7, 11, 15, 19, 24, 25, 37, 39
- 7.2 p.402 #13, 15, 21, 26, 31 – 41 odd, 47, 61, 63, 73 – 81 odd
- 7.3 p.409 #10, 12, 15, 17, 27, 28, 30, 32, 43, 55, 57
- 7.4 p.419 #2, 3, 4, 5, 7, 8, 9, 13, 17, 27, 33, 35, 37, 41, 45, 47, 53, 69 – 75 odd