



You will be given the opportunity to retake one of the three and a half tests during the last week of the course. IF you miss a test, then you will receive a zero for that test. At the end of the semester, you may elect to make up that test.

Problems done in class and finished at home on Webassign count the equivalent of 1 test. The webassign problems must be completed by the due date. Your Webassign grade will be the percentage of problems you do out of the total. These running totals are tallied on webassign.

Quizzes based on the text reading or lecture videos OR on an important math skill will be given in the first 5 - 10 minutes of class. There will be no makeup quizzes. Most quizzes will be open notebook. The quiz average will count for half a test. Quizzes will be graded 0-4. 0 is a class absence. 1 is attended class, but did not do the assigned reading or video watching. 2 is for demonstrating some familiarity with the topic. 3 is for having a rough idea about the topic. 4 is correct for the most part, but may contain minor errors.

Grade distribution:

3 test (one each for chapters 3,4, and 5) count a total of 6/14 (42%) or (2/14 each)

Half test on limits counts as 1/14 (7%)

Daily quizzes on reading/video lectures 1/14 (7%)

Problems on Webassign count as 2/14 (14%)

Final exam count 4/14 (28.5%)

### **College Withdrawal Policy and the N (no show) grade:**

You may withdraw from this class any time up to and including May 13, and you will receive a W grade on your transcript. However, you must complete a withdrawal form in the Registrar's Office at the time of withdrawal; if you merely stop attending classes before April 10, you will receive a grade of "N" which means "no show". Financial aid students MAY have to reimburse the college for courses in which they have an N. Your best bet is to wait till after April 15 which is more than 2/3 the way thru the course and withdraw. If you do not take the final exam, you will receive a grade of F, regardless of the other work you do. No one's signature other than your own is required on the Withdrawal form. I strongly suggest you discuss your withdrawal with me before you submit the forms so that we can discuss your status and your options. Financial aid students should also discuss withdrawal from a course with a financial aid counselor so that you know the monetary ramifications.

### **Disabilities Statement:**

If you have a hidden or visible disability that may require classroom or test-taking modifications, please see me as soon as possible so arrangements can be made. If you have not already done so, please contact the Learning Specialist, Chris Scarborough, at 860-892-5751.

### **Course Outcomes:**

(note that #1-11 are Precalculus topics)

1. Find the domain and range for a given function.

2. Classify the elementary functions; know their properties and graphs.
3. Understand the inverse of a function graphically, algebraically, and by coordinate pairs.
4. Compute the value of a function at the given independent variable. (Given  $x$ , find  $y$ .)
5. Solve for an independent variable given a value for the dependent variable. (Given  $y$ , find  $x$ .)
6. Classify a function as odd, even or neither.
7. Compose two or more functions. Decompose a function into simpler functions.
8. Sketch the graphs of functions using translations and reflections of the elementary functions.
9. Identify whether or not a relation is a function. The relation may be given as a graph, table or algebraic equation.
10. Find and interpret the slope of a line.
11. Find an equation of a line given the slope and a point or given two points.
12. Find the limit of a function using algebra, a table of values or a graph.
13. Determine whether or not a function is continuous. Indicate the points of discontinuity and whether the discontinuity is essential or not.
14. Understand the derivative as the instantaneous rate of change at a point in contrast with the average rate of change between 2 points on a curve.
15. Use the limit definition of the derivative to differentiate a function, understanding that it is the slope of the tangent to the curve at a given point.
16. Use the rules for differentiation, including the chain rule, to find the  $n$ th derivative of a function. Functions include the trigonometric, exponential and logarithmic functions.
17. Compute the derivative of the inverse of a function given the derivative of the function.
18. Solve applications involving exponential growth and decay.
19. Apply L'hospital's Rule to find limits of functions.
20. Find an equation of a line tangent to a function at a given point.
21. Solve applications involving rates of change of a function, including velocity and acceleration problems.
22. Use implicit differentiation to find the derivative of a function.
23. Solve related rates problems.
24. Use Newton's method to approximate a solution to an equation.
25. Find and apply the differential of a function.
26. Understand the relationship between the graph of a function and the graph of its derivative.
  - a. Given two graphs, determine which is the function and which is the derivative of the function.
  - b. Given the graph of a function, sketch its derivative.
  - c. Given the graph of the derivative of a function, sketch the function.
27. Use the first derivative to determine whether a function is increasing, decreasing or neither. Find the critical points.
28. Use the second derivative to determine whether a function is concave up, down or neither. Find the points of inflection.
29. Find absolute extrema of a function on a given interval.
30. Use the First and Second Derivative Tests to find relative extrema of a function.

31. Sketch the graph of a function using techniques from calculus. (Show all intercepts, relative extrema, points of inflection, concavity, and asymptotes.)
32. Understand Integration as the inverse of Differentiation, as the limit of Riemann sums, and as area under a curve.
33. Evaluate indefinite and definite integrals using rules for integration, including substitution.
34. Compute the average value of a function. Solve applications involving average value.
35. Use integration to find the area under a curve or bounded by two curves.
36. Use integration to find the volumes of solids of revolution by the Disk Method.
37. State, understand and apply the Fundamental Theorem of Calculus, the Mean Value Theorem, and the Intermediate Value Theorem.

### **Academic Integrity:**

Academic integrity is essential to a useful education. Failure to act with academic integrity severely limits a person's ability to succeed in the classroom and beyond. Furthermore, academic dishonesty erodes the legitimacy of every degree awarded by the College. Collaboration is encouraged on many assignments such as seminar assignments and homework. Tutors are available to assist you with this sort of work.

Exams are considered individual work and must be completed without unauthorized assistance of any kind, including help of other students, tutors, or notes. All test material is to be turned in with the test paper. Attempting to bring work out of the testing area and/or share that work with other students is consider cheating. Cheating on tests, misrepresentation of attendance, falsifying records, or lying will result in loss of credit for all work involved.

A full copy of the college's academic integrity policy is in the school's catalog and in the student handbook.

### **Emergency Closings or class cancellations**

If the college administrators decide to issue an emergency school closing, you can receive immediate notifications if you go to my.comnet. and register for the mycommnet.ALERT that will phone or text you as soon as a closing is announced. The Alert is more reliable than my email, since sometimes I lose internet service during a storm. If I am going to cancel class or office hours, I will email everyone, so please be sure your email on the college my.comnet system is correct.

Schedule of classes Calculus 1 Spring Mat 254, Professor Decker  
Course number 31804, Mon and Wed 1-2:40 Rm D221

Take notes on the lecture videos and/or read the text for the given sections before the due date. Your notes on each section will be quizzed in class on the date shown.

Week 1 Intro and some precalc review Jan 24

Week 2

- 1/29 Section 2.1 Tangent and Velocity Problem  
Section 2.2 Limit of a Function
- 1/31 Section 2.3 Calculating Limits using the limit laws.  
Section 2.4 Precise definition of Limits

Week 3

- 2/5 Section 2.5 Continuity  
Section 2.6 Limits at Infinity: Horizontal Limits
- 2/7 Half Test on Sections 2.1-2.6 Limits  
Section 2.7 Derivatives and Rates of Change

Week 4

- 2/12 Section 2.8 The Derivative as a Function
- 2/14 Section 3.1 Derivatives of Polynomial and Exponential Functions  
Section 3.2 The Product and Quotient Rules

Week 5

- 2/19 Section 3.3 Derivatives of Trig function  
Section 3.4 The Chain Rule
- 2/21 Section 3.4 More Chain rule practice, Section 3.5 Implicit Differentiation

Week 6

- 2/26 Section 3.6 Logarithmic Differentiation  
Section 3.7 rates of change in the natural and social sciences
- 2/28 Section 3.8 Exponential Growth and Decay

Week 7

- 3/5 Section 3.9 Related Rates
- 3/7 Section 3.10 Linear Approx and Differentials  
Section 3.11 Hyperbolic Functions: quick exposure to hyperbolic compared to circular trig functions. Use formula to find the derivatives of hyperbolic functions.

Week 8

- 3/12 Review Sections 2.7-3.11
- 3/14 Test on sections 2.7- 3.11 Derivatives

**SPRING BREAK 3/17-3/24**

Week 9

- 3/26 Section 4.1 Maximum and Minimum Values
- Section 4.2 Mean Value Theorem
- 3/28 Section 4.3 How derivatives affect the shape of a graph

Week 10

- 4/2 Section 4.4 Indeterminate Forms and L'Hospital's Rule
- Section 4.5 Summary of Curve Sketching
- 4/4 Section 4.6 Graphing with a Calculator
- Section 4.7 Optimization Problems

Week 11

- 4/9 Section 4.8 Newton's Method for finding roots
- Section 4.9 Antiderivatives
- 4/11 REVIEW CH 4.

Week 12

- 4/16 TEST 4.1-4.9 Applications of the derivative
- 4/18 Section 5.1 Areas and Distance
- Section 5.2 Definite Integral

Week 13

- 4/23 Section 5.3 Fundamental Theorem of Calculus
- Section 5.4 Indefinite Integrals and the Net Change Theorem
- 4/25 Section 5.5 The Substitution Rule

Week 14

- 4/30 6.1 and 6.2 overview: areas between curves and volumes of revolutions
- 5/2 Review Chapt 5 and 6.1-6.2 Integrals

Week 15

- 5/7 Test Chapter 5 and 6.1-6.2
- 5/9 Final Exam Review Problem set due

Final exam week:

5/14 Make up test date for students who wish to replace their grade on one of the three tests. If student does not wish to do a make-up test, he need not come to class.

5/16 FINALEXAM during class time in E225