

CALCULUS I: MATH 151-01 & MATH 151-01
Fall 2007 Syllabus and Schedule

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Section 01: MTWRF 10:00 am – 10:50 am

Section 02: MTWRF 1:00 pm – 1:50 pm

- Course:** The main topics of Calculus I involve the differentiation and integration of one variable. Calculus forms the foundation for most, if not all, of the physical sciences in addition to most social sciences.
- Prereqs:** There are no prerequisites for this course, but all students should have had the equivalent of two years of high school algebra, one year of geometry, and one year of trigonometry.
- Objectives:** I hope everyone will hone their mathematical abilities to reason quantitatively, logically, confidently, and eventually correctly. By the end of this course, every passing student should
- ... understand limits of representative functions¹ and be able to compute them where they exist.
 - ... be able to determine whether or not a representative function is continuous or not.
 - ... know the difference between a tangent line and a secant line, and compute the tangent and secant lines.
 - ... know the relationship between the derivative of a function and the tangent line to the function at a given point.
 - ... be able to interpret the derivative of a function describing a quantity in an application.
 - ... be able to compute the derivatives of representative functions by judicious use of the power rule, product rule, quotient rule and chain rule.
 - ... understand the first and second derivative test.
 - ... compute the local and global extrema, and inflection points of representative functions.
 - ... form connections between a function to its graph using information about its derivatives, extrema, concavity and inflection points.
 - ... be able to combine differentiation with mathematical modeling for the optimization of problems in the physical and social sciences.
 - ... be able to approximate distance traveled and area under a curve using Riemann sums.
 - ... be able to antidifferentiate representative functions with the judicious use of substitution, if necessary.
 - ... understand the Fundamental Theorem of Calculus.
 - ... be able to find the area between two curves.

¹The term *representative function* refers to functions that are similar in nature to those discussed in your textbook or found in problems and projects associated with the course.

Your resources: All of the following will help you be successful at calculus

Textbook: We will be using the 4th edition of Hughes-Hallett's Calculus published by Wiley 2005.

Office Hours: MTWR 2:00 pm – 3:00 pm. This is time I have set aside especially for you. Office hours are a valuable resource and I hope you take advantage of them early and often. I want to help you learn this material, so do not be shy about seeing me outside of class. If you need to see me at a time other than an office hour, feel free to “drop in” or make an appointment.

Calculator: I expect everyone to have at least a scientific calculator. You will **not** be allowed to use calculators on exams. However, there will be assignments where a calculator will help.

Classmates: Math is not a competitive sport! There are many obvious reasons to work together. Even if you end up helping others most of the time, teaching is one of the best ways to gain a deeper understanding of a subject. Please note that there is a major difference between getting assistance from a classmate and copying. Please be honest.

Time: The best way to learn mathematics is to spend time with it. It is your responsibility to come to class each day, and attendance is crucial to success in this course.

Grading: Your grade is determined by your understanding of mathematics and your ability to communicate this knowledge to me on exams and other assignments.

60% points - Five mid-semester exams (12% each)

15% points - Final exam

15% points - Homework

10% points – In-class grade (participation, attendance, quizzes)

The following letter grades are guaranteed if you earn the corresponding percentage:

100 ← A → 93 ← A- → 90 ← B+ → 87 ← B → 83 ← B- → 80 ← C+ → 77

77 ← C → 73 ← C- → 70 ← D+ → 67 ← D → 63 ← D- → 60 ← F → 0

Exams: All exams will occur in class on the days listed on the class schedule. There are no makeup exams without prior notification and a valid, documented reason.

Homework: Homework will be assigned and collected regularly. I do not accept late assignments. On an assignment, half the points on an assignment will be awarded for completeness while the rest will be given for several randomly selected problems.

Recitations: Before each of the exams there will be a review and problem session. I will be dividing the class into two groups to allow more opportunity for discussion and practice.

Attendance: Students are expected to attend all classes. A student missing a class, due to valid reasons, is expected to find out the material discussed in class and make up any work that has been missed. Repeated tardiness or more than three unexcused absences will lower your grade.

Note: The Academic Dishonesty Policy as explained in Scot's Guide will be strictly enforced. Plagiarism could result in the failure of the course and possible suspension from the college. See Academic Dishonesty in Scot's Guide and Planner.

Math 151-01 & Math 151-02 Tentative Schedule

Monday	Tuesday	Wednesday	Thursday	Friday
8/27 Academic Orientation No Classes	8/28 Coordinate Geometry Lines	8/29 Parabolas Circles	8/30 Interval Notation Functions & Change	8/31 Exponential Functions
9/3 Scaling & Shifting Functions	9/4 Logarithmic Functions	9/5 Trigonometry	9/6 Trigonometry	9/7 Rational Functions
9/10 Rational Functions	9/11 Continuity	9/12 Recitation Group A	9/13 Recitation Group B	9/14 Exam 1
9/17 Limits	9/18 Limit Laws Limits at Infinity	9/19 Velocity	9/20 Derivative at a Point	9/21 Derivative as a Function
9/24 Derivative as a Function	9/25 Interpretations of the Derivative	9/26 2nd Derivative Differentiability	9/27 Power Rule	9/28 Power Rule Polynomials
10/1 Recitation Group B	10/2 Recitation Group A	10/3 Exam 2	10/4 Exponential Function	10/5 Product Rule
10/8 Product Rule Quotient Rule	10/9 Product Rule Quotient Rule	10/10 Chain Rule	10/11 Chain Rule	10/12 Trigonometry
10/15 Fall Break No Classes	10/16 Fall Break No Classes	10/17 Trigonometry	10/18 Inverse Functions	10/19 Linear Approximations
10/22 Mean Value Theorem	10/23 Recitation Group A	10/24 Mentoring Day No Calculus	10/25 Recitation Group B	10/26 Exam 3
10/29 Increasing/Decreasing Local Extrema	10/30 Concavity Inflection Points	10/31 Families of Curves	11/1 Optimization	11/2 Optimization
11/5 Optimization & Modeling	11/6 Optimization & Modeling	11/7 Distance Traveled	11/8 Riemann Sums	11/9 Definite Integral
11/12 Recitation Group B	11/13 Recitation Group A	11/14 Exam 4	11/15 Definite Integral	11/16 Fundamental Theorem of Calculus
11/19 Fundamental Theorem of Calculus	11/18 Integration Theorems	11/21 Thanksgiving No Classes	11/22 Thanksgiving No Classes	11/23 Thanksgiving No Classes
11/26 Antiderivatives	11/25 Antiderivatives	11/28 Antiderivatives Analytically	11/29 Antiderivatives Analytically	11/30 Differential Equations
12/3 Second Fundamental Theorem of Calculus	12/4 Equations of Motion	12/5 Recitation Group A	12/6 Recitation Group B	12/7 Exam 5
12/10 Integration by Substitution	12/11 Integration by Substitution	12/12 Course Review	12/13 Reading Day No Classes	12/14 Finals Week Begins

Final Exam: Sunday, December 16 from 1pm – 4pm