

MA160 – Calculus 1

Dr. Stefan Ehrlich

Graduate Computer Science / Mathematics Department
Fall Semester, 2005

Contact Info:

Phone: 603-888-1311x8531
Office: Sylvia Trottier - 313
Email: sehrlich@rivier.edu

Text:

Calculus
Hughes-Hallett, 2005
John Wiley and Sons, Fourth Edition

Office Hours:

Monday 1:30- 2:30, 5:15- 6:30
Wednesday 1:30-2:30, 5:15-6:30
Thursday: 4:00 – 6:30

Brief Course Description:

Calculus 1 introduces the student to two separate (though related) classes of problems.

The first involves finding the rate at which one variable is changing with respect to another variable. For example, we might be interested in how fast a thrown ball is traveling at any moment before it is caught. Differential Calculus is the branch of mathematics dealing with these problems.

The second type of problem involves finding a function, or area under a curve, when the rate of change is known (first derivative). For example, given the velocity at every moment the ball is traveling, find the distance traveled. This problem is solved using Integral Calculus.

Course Objectives:

This course has been designed with two important goals in mind:

the completion and/ or review of material covered in a standard Pre Calculus course.
the introduction of differential and integral calculus concepts

A solid understanding of these topics is essential for further study in the field of mathematical analysis

Classroom Policies:

Students are expected to attend and participate in all classes. Attendance is taken at the beginning of each period. Please notify the instructor in advance of any anticipated absence whenever possible. It is your responsibility to make up any material missed whenever you are absent. Assignments are related to material covered in class. The homework problems are always covered in a timely fashion and questions about the problems should be raised at the next class meeting. The study of mathematics/computer science requires regular work and plenty of practice. Postponed homework usually results in poor comprehension and performance.

Teaching Strategies:

Lecture format, with numerous examples chosen to illustrate theoretical concepts. Lots of drill with emphasis on practice, practice, and more practice. Questions are encouraged and discussion of material stressed.

Course Requirements and Grading Policies:

Students will be evaluated based on two midterms, a set of homework assignments, and a final exam as follows:

Midterms - 40% Homework Assignments – 20% Final - 40%

All tests are closed book and the final is comprehensive. The results will be converted to a letter grade in keeping with grading policies of the college.

Material Covered:

1. Pre Calculus
 - Exponential, Logarithmic, and Trig metric Functions
 - Rational Functions
 - Continuity and Limits
2. Derivatives
 - Velocity, Slope, and Rate of Change
 - Finding and Interpreting the First and Second Derivatives
 - When is a Function Differentiable?
3. Short Cuts and Rules for Differentiation
 - Polynomial, Exponential, Logarithmic, and Trig metric Functions
 - Product and Quotient Rules
 - Chain Rule
 - Implicit Functions
 - Inverse Trig metric Functions
 - Parametric Equations
4. Definite Integral
 - Measuring Distance Traveled – Area under the Curve
 - Definite Integral
 - First Fundamental Theorem of Calculus
5. Constructing Antiderivatives
 - Graphically, Numerically, and Analytically
 - Differential Equations (optional, as time allows)
 - Second Fundamental Theorem of Calculus (optional, as time allows)