Math 123
syllabus
Fall, 2008

Professor:	Matthew Neal (nealm@denison.edu)
Office and phone:	Olin 202 (6288)
Office Hours:	W 1-2:30, 3:30-4:30 R 1-4:30 p.m. or by appointment
Web site:	http://personal.denison.edu/~nealm/

Course

This is a course in single variable Calculus, which is that subset of mathematics concerned with the theory and application of limits. This is the study of sequences of numbers (or functions, or other objects) that either get infinitely close to another number or grow infinitely large with respect to some notion of distance. Many useful mathematical constructions (such as a derivative, an integral, or many familiar functions) are built out of limits. These constructions are often crucial to our modeling of the physical world. For example, they provide the conceptual framework for understanding the rate of change of one variable with respect to another and the accumulation of one quantity as other variables change. The words "single variable" mean that we will only consider applications of limits to functions and variables that depend on one input variable. Math 222 and part of Math 124 extend these ideas to the multivariable case.

Audience

This course is intended for students who either (1) Have not taken Calculus but have strong precalculus skills (algebra, graphing algebraic relations, trigonometry, logarithms, interpreting word problems) or (2) Have taken Calculus but are not yet able to achieve a 4 or 5 on the AP examination. You must have a placement test score of 12 or higher, an AP score of 3, or special instructor permission to enroll in this course. Students who scored a 4 should be in Math 124 unless they feel their precalculus math skills are weak and need to use Math 123 (which makes strong use of precalculus) to brush up. Students who scored a 5 should be in 124. Keep in mind that successful completion of Math 124 gives credit for Math 123 also.

Book

Stewart: Calculus (early transcendentals) 6th edition

Grades and Expectations

The grade will be calculated with the following weights:

- 20 % for each of four tests
- 20 % Final exam

Grade Scale: 90-100 A 78-89 B 66-77 C 50-65 D 0-49 F

Tests

Tests occur every three weeks on Friday. The first test is on September 19th. You are responsible to understand everything said in class or written in the text for the sections covered as well as every problem assigned. This includes the homework problems for the test week. Note that *understand* does not mean *memorize* and the problems on the test will not be identical copies of homework problems.

Homework and Quizzes

Every Friday on non-test days will begin with a 10 minute quiz. This quiz will consist of 2 homework problems from the week's assignment. If you have completed and studied the assignment, this should

be an easy way to get points. Each problem is worth 2 points and your score is added to the next test. Every Thursday will be devoted entirely to discussing the week's homework.

Office Hours

Every Wednesday from 1-2:30 and 3:30-4:30 and Thursday from 1 to 4:30 I will be in my office for help with Math or other issues. Please come to office hours so I can get to know you better!

Late Work

Late tests will receive a 20 % point penalty per day late unless there is a written note (such as a note from Whistler) that verifies a VERY strong excuse (such as illness or important sports team events). Late quizzes are not accepted at all without a written excuse as above.

Calculators

Graphing calculators are never permitted on tests. On some tests I may permit a scientific calculator for approximation problems where the accuracy of the approximation is important. Leave all answers as fractions and leave all relevant transcendental numbers (such as π or e) in symbolic form unless the instructions say otherwise.

Academic Integrity

Academic dishonesty will not be tolerated. This includes looking at anyone else's work or looking at any outside materials during the test. As is indicated in Denisons Student Handbook , available through mydenison.edu , instructors must refer every act of academic dishonesty to the Associate Provost, and violations may result in failure in the course, suspension, or expulsion.

Disabilities

Any student who feels he or she may need an accommodation based on the impact of a disability should contact me privately as soon as possible to discuss his or her specific needs. I rely on the Academic Support and Enrichment Center in 102 Doane to verify the need for reasonable accommodations based on documentation on file in that office.

Schedule

Week 1	2.1,2.2, 2.3 Intro to limits, limit laws
Week 2	2.4, 2.5, 2.6 Precise definition of a limit, continuity, limits at infinity, asymptotes
Week 3	2.7, 2.8 Derivatives, rates of change, derivative as function, **Test I**
Week 4	3.1, 3.2, 3.3 Polynomials and exponentials, product + quotient rules, trig functions
Week 5	3.4, 3.5, 3.6 The chain rule, implicit differentiation, logarithmic functions
Week 6	3.7, 3.8 Rates of change in the sciences, exponential growth and decay, **Test II**
Week 7	3.9, 4.1, 4.2 Related rates, optimization on a compact interval, mean value theorem
Week 8	4.3, 4.4, 4.5 Derivatives and the shape of a graph, indeterminate forms, curve sketching
Week 9	4.7, 4.8 Optimization, **Test III**
Week 10	4.9, 4.10, 5.1 Newton's method, anti derivatives, area and distance
Week 11	5.2 5.3, 5.4 The definite integral, the fundamental theorem of Calculus
Week 12	5.5, 7.1 Substitution, integration by parts, **Test IV**
Week 13	6.1, 6.2, 6.3 Area between curves, volume
Week 14	6.4. 8.3 Work, force due to fluid pressure, review part I
Sat., Dec. 13th (time TBA)	Review part II
Mon., Dec. 15th, 9-11 a.m	Final Exam for 9:30 class
Thu., Dec. 18th, 2-4 a.m.	Final Exam for the 8:30 class