Math 134: Calculus I
Spring 2009

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Course Description: The first quarter of calculus concentrates on differential calculus: derivatives of functions and applications of derivatives. The derivative is defined using a limit, based on concepts of the slope of a tangent line, and instantaneous rate of change or velocity. The derivative is then applied to problems including graphing, optimization, related rates, and solutions of equations. This calculus course has a computer laboratory component with projects that provide students with an opportunity to practice collaborative learning and writing mathematics.

Class Schedule: MTWThF 9-9:50 AM in ADMIN 308. On five Thursdays during the quarter we will have lab and will meet in ADMIN 224. These Thursday labs are scheduled for April 9, April 23, April 30, May 14, and May 21. All other Thursdays we will meet in ADMN 308.

Goals: The mathematics department has established the following goals.

Goals for students in all mathematics courses: Each student will

- develop the ability to think abstractly and critically;
- improve the ability to communicate mathematically through writing and speaking;
- represent abstract concepts pictorially;
- use mathematics as a modeling and problem-solving tool;
- appreciate and use appropriate technology, becoming proficient with, but not dependent on, symbolic graphing tools or mathematical software.

Specific goals for students in Math 130: A student who successfully completes MATH 134 will

- understand the function concept and use many ways of representing functions: analytically, graphically, verbally, by tables.
- understand and use the concepts of limits and continuity.
- understand the definition of the derivative of a function, together with various interpretations of the derivative concept.
- develop proficiency in finding derivatives of functions, both using the definition of the derivative and using theorems (rules) for differentiation, with emphasis on algebraic, trigonometric, and exponential functions.
- solve maxima and minima problems, giving complete, well-written solutions. Study other applications of the derivative.
- improve the ability to write mathematics and the ability to work with others through the writing of collaborative computer lab reports.
- use graphing calculators and computer software to investigate problems involving mathematics and to produce well-written and attractive computer lab reports.

Core Curriculum Requirement: MATH 134 may be used to satisfy the Seattle University Core mathematics requirement. In common with all Phase I core courses, this course emphasizes active learning, critical thinking, and writing assignments, to help develop understanding of the concepts and applications of the course. Quantitative skills and problem solving abilities are important components of a liberal education. You are encouraged to be an active participant at all times; learning mathematics requires much active thinking about the concepts and practice with problem solving.

Prerequisites: In order to take MATH 134 you must satisfy the following requirements:

Algebra Prerequisite: A grade if C- or better in MATH 120, or a score of at least 640 on the mathematics section of the SAT, or a score of at least 28 on the mathematics section of the ACT, or a score of at least 25 on the algebra section of the SU Math Placement Exam.

Trigonometry Co-requisite: A grade if C- or better in MATH 121, or enrolled concurrently in MATH 121, or a score of at least 6 on the trig section of the SU Math Placement Exam.

Text: *Calculus,* by James Stewart (6^{th} edition). The course works carefully through Chapters 1-4. See the attached course schedule for more details

Calculator: A graphing calculator is an important tool in MATH 134, so you are required to have access to have access to one for use on homework problems and in-class work. A TI-84 plus or TI-83 plus is suggested if you do not already have a calculator.

Homework: Homework will usually be due twice a week. Learning mathematics is achieved by doing mathematics, so to succeed in the course it is critical that you carefully work all assigned problems. To receive full credit on your work, your assignments must be neat and organized. Late homework is not accepted, but your two lowest homework scores will be dropped. Collaboration on solving homework problems is strongly encouraged, but you must write your solutions individually. More precisely, you may work together and share information verbally, on scratch paper, or at a blackboard, but you are obligated under Seattle University's Academic Honesty Policy (see www.seattleu.edu/regis and click on the "Policies" link) not to share the homework papers that you plan to submit. Under no circumstances should a solution be copied from someone else.

Labs: On many Thursdays the class will meet in ADMIN 224 to work in small groups on projects using the software Mathematica. For additional work with Mathematica and to finish your lab reports, you may use the computers in the open labs in the Engineering building. Facility with this software is important since most real-world applications of calculus involve the use of some type of computer software, and all subsequent calculus courses at Seattle University will have a Mathematica component. The labs are designed to strengthen your understanding of important ideas in the course and to introduce you to some applications of the subject. After each lab your group will submit a project report, which will be graded. As with all group work, every group member should participate actively, receive support from the group, and make sure responsibilities are shared equitably. Attendance is required each day our

class meets in the computer lab. Your lab partners rely on you to arrive on time prepared to work, learn, and participate.

Quizzes: There will be six short quizzes. Make-up quizzes will not be given, but your lowest quiz score will be dropped. See the attached schedule for the quiz dates.

Tests: There will be three in-class tests and a two-hour cumulative final exam. If you miss one test, then the final exam will serve as a make-up test. A score of zero will be given for any additional missed tests. If you take all three tests and your grade on the final exam is higher than your lowest test grade, then the final exam grade will replace your lowest test grade.

Test 1: Friday, April 17
Test 2: Friday, May 8
Test 3: Friday, May 29
Final: Thursday, June 11, 12:00-1:50 PM

Participation: Students are expected to prepare for, attend, and participate in all class meetings. To prepare for class you should look over your notes from the previous class and try the assigned problems. I always begin class by asking for questions, so prepare a question to ask if you are confused about something from the last class or stuck on a homework problem. You should also prepare by reading assigned material before class. Even reading for only 10-15 minutes for familiarity can significantly help you understand the material when we discuss it in class. Once prepared, please come to class on time, ready to learn and participate, and with your **cell phones turned OFF**. Participating in class includes answering and asking questions, offering ideas and conjectures, listening and working effectively with your group during group problem solving, doing assigned readings, volunteering to do a problem on the board, and simply being alert and paying attention in class. Participating and talking are not necessarily the same thing.

Grading: The points for the course will be distributed as follows:

Homework	50 points
Quizzes	80 points
Labs	80 points
Midterm tests (90 points each)	270 points
Final exam	160 points
Total	640 points

Based on the above point distribution, students are guaranteed the following course grades, *including* + *and* -. The percentages may be lowered, but they will not be raised.

90% and above: A
80% and above: B
65% and above: C
55% and above: D

Assistance: There are a number of people who want to help you succeed in this course. The course material builds on itself, so it is important to try homework problems the day they are assigned and not to wait until you are already behind to seek help. When you have difficulties with a concept or just want to discuss an idea further, you are strongly encouraged to seek help from:

1. Your instructor: Come to my office hours, make an appointment to see me, or just drop by if my office door is open. I want to help each of you to do your best.

2. Your classmates: Many students learn the most when they work with others. You will often be required to work together in class, and I hope you will similarly study together outside of class and cooperate on homework. Ask each other lots of questions. This even benefits students who are comfortable with the material – you know you really understand something if you can explain it to others.

3. The Math Lab: You may drop by ENGR 300 any time it is open to receive help. The Math Lab is open about 45 hours a week (the exact hours will be posted and announced in class) and is staffed by talented students who were selected as tutors because they have good communication skills and successfully completed at least three quarters of calculus.

4. The Learning Center: The center is located in Loyola 100 and provides services for all SU students to help them get the most out of their education. The Learning Center provides one-on-one consulting about study skills, arranges course tutoring, and offers a variety of interactive workshops. It also provides services for students with learning, physical, and psychological disabilities. Please make an appointment with the Learning Center immediately (phone 296-5740) if you think their services could contribute to your success at Seattle University.