

MTH U131 (Calculus for Business and Economics) Fall 2005

Instructor: Rekha Bai
Room: 541Lake Hall, x5640
E-mail: r.bai@neu.edu
Office Hours: Mon, Wed, Thu 12 – 1PM and **by appointment.**

Lectures: **Mon., Wed., Thurs. 9:15-10:20 AM 425 SH**

Materials: *Calculus Concepts (Brief Third Edition): An Informal Approach to the Mathematics of Change* by LaTorre, Kenelly, Fetta, Harris, Carpenter, Houghton Mifflin, Boston, 2005;
The **TI-83** (or **TI-83 Plus**) or **TI-84** calculator is required. **No other calculator may be used on tests or the project without the explicit permission of your instructor.** A class packet (for Fall 2005) must also be purchased from NU Reprographics (x2766). **Please bring your textbook, packet and calculator to each class.**

Course Content

This course introduces students to the use of derivatives and integrals in solving problems in business and economics, e.g., maximizing profit, calculating average investment income and consumers' surplus. (A more detailed syllabus is given below.) **A project involving optimization is also required.** This project is described in the class packet. The graphing calculator is **used extensively** and prior familiarity with graphing calculators is helpful. Prerequisites: MTH U130 or the equivalent. Note that MTH U131 may be used to satisfy the mathematics proficiency requirement of the College of Arts and Sciences.

Assignments

A list of homework exercises from the textbook and class packet is attached. (This list is subject to revision.). Homework exercises should be done by the next class after they are assigned. Homework exercises from the textbook will not be collected. Even if they are not collected, you are responsible for knowing the solutions of **all** homework exercises. The questions on exams and quizzes will be based on homework exercises, **quiz and test review exercises in the packet** and the material in my lectures. There will also be a set of homework exercises posted on the web site. The entire set of web homework exercises will count as one quiz.

Attendance

You are expected in class each day. If for some reason, you are unable to come to a class, then (if possible) please send an e-mail to let me know. Three or more unexplained absences will lower your final grade.

Exams

There will be 7 quizzes (20-30 minutes each), 1 hour test (the midterm), and a 2 hour final exam. (Only the best 6 quiz grades including the web homework grade will be counted). The final exam will count 40% of your course grade. **All students without**

legitimate conflicts approved by the instructor will take the final exam on 12/13/2005 at 10:30 AM. The final exam is cumulative and is common for all sections of MTH U131. **Do not make travel plans that conflict with the final exam**

Grading

Your final grade will be determined by the following quantities: quiz grades (30%); midterm grade (15%); project grade (15%); and final exam score (40%).

The last day to drop a course without receiving a 'W' grade is September 23rd. The last date to drop a class with a 'W' is November 18th. As a matter of Math Department policy: The **I grade** (incomplete) will be given only rarely. It is intended to cover real emergency situations in which a student who is doing reasonably well (**C** or better) is unable, *due to circumstances beyond the student's control*, to complete all course requirements (e.g., is unable to take the final exam due to hospitalization). An **I** may not be used to rescue a failing grade, or to postpone the final.

If you want to see me, but cannot do so during my office hours, then please see me before or after any class to set up a convenient time. Also, please take advantage of the office hours of the other instructors in the course when they are more convenient.

Academic Honesty

Cheating will not be tolerated. All incidents of cheating will be reported to the Office of Judicial Affairs. The University's cheating policy and related disciplinary actions are detailed in the Student Handbook.

Tutoring: There is a free math tutoring center located in the math department on the 5th floor of Nightingale Hall (540B NI). Hours of operation for the fall will be announced. All tutoring is done on a first come first served basis. Students must come in person to schedule appointments. No appointments can be made by phone. Keep in mind:

- Students go to the tutoring center for help in a dozen different courses and the tutors are not meant to be experts in all of them. The better prepared you are with a specific question, the better able the tutor will be able to help you.
- Not all tutors are familiar with the TI-83. If you have problems with the calculator, have someone such as me or another instructor help you before you go to Cahners.

Resolving disputes and complaints: If you are not satisfied with my responses to your serious concerns (including your final course grade), please consult the vice chairman of the math department, Professor Stanley Eigen, 526 LA, x5647, e-mail: s.eigen@neu.edu.

Note that the syllabus below is tentative. The instructor reserves the right to make changes if necessary. It is the responsibility of each student to stay abreast of what happens in the classroom, changes in the assigned exercises and changes in the dates of quizzes or exams. All students should consult the Blackboard site for this course regularly.

9/7: 3.1: average rate of change	HW: 13ab,17, 26a. Read project description in packet
9/8: 3.1 Using the TI-83	HW: 12,13d,14; packet Model Review probs 1,2
9/12: 3.2: Inst. Rate of change 3.3: Derivatives	HW: 3.2: 7a,8,10, 17, 21, 22; 3.3: 2,5,13
9/14: 4.1: slope graphs; 4.2: Deriv. Rules	HW: Handout; packet Algebra Review Probs.1-5
9/15: QUIZ 1 ; 4.3: More Deriv.Rules	HW: 4.2: 1-6(slope equations only), 7-14
9/19: 4.2; 4.3	4.3: 1-6(slope equations only), 7-14
9/21: 4.4: chain rule PROJECT PART A DUE	HW: 4.4: 9,10,14
9/22: QUIZ 2 ; 4.4: chain rule (9/23: Last day to drop a course without receiving a "W" grade)	HW: 4.4: 17-37
9/26: 4.5: Product Rule	HW:4.5: 10-26
9/28: 4.2 : Applications Using nDeriv on the TI-83	HW: 4.2: 21(a)(b), 24, 26
9/29: 4.3: Applications	4.3: 16(a)(b)(c), 22, 23(a)(b)(c) packet Compound Interest Review Probs: 1,2
10/3: 4.4: Applications	HW: 41(ignore per cent rate of change),42a,44
10/5: QUIZ 3 ; 4.5: Applications	
10/6 4.5: Applications PROJECT PART B DUE	HW: 4.5: 4, 28,30abcde
10/10: Columbus Day – No Classes	
10/12: 5.1: Approximating change $f(x+h)-f(x) \approx f'(x)h$ Marginal Revenue, Marginal Cost, Marginal Profit	HW: 5.1: 3,5,6, 17abc, 18abc, 19abc, 20ab packet Algebra Review Probs 6-12
10/13: 5.2: Optimization	HW: packet Optimization problems 1-10
10/17: 5.2 (using calculator)	HW: 5.2: 17a, 24, 29 HW: 5.2: 25 (like project optimization);
10/19: Midterm Review	
10/20: MIDTERM	
10/24: 5.3: Second derivative, Inflection Points; Notes on Optimization (class packet) PROJECT PART C DUE	HW: 5.3: 2, 29 HW: packet Optimization problems 11-14

10/26: Finding inf. pts using the TI-83 (class packet)	HW: 5.3: 7, 9, 14
10/27: 6.4 Antiderivatives	HW: 5.3: 20a,b
10/31: 6.4: Antiderivatives	HW: packet Anti-derivative problems 1-5
11/2: Quiz 4 ; The general antiderivative Finding a specific antiderivative	HW: 6.4: 9-14, 15, 17 packet Antiderivative problems 6-10
11/3: 6.4: Applications PROJECT PART D DUE	HW: 6.4: 27, 32, 33
11/7: 6.4: Applications	HW: 6.4: 19-21
11/9: QUIZ 5	
11/10: 6.1: Accumulated change Area approximation	HW: 6.1: 8ac, 13a, 18ab
11/14: 6.2: The definite integral 6.4: Fundamental Theorem of Calculus	HW: 6.2: 1, 4 HW: 6.4: 1-4
11/16: 6.5: Evaluating definite integrals using FTC PROJECT PART E DUE	HW: 6.5: 8c, 9c, 10c, 11c packet Additional Definite integral problems
11/17: QUIZ 6 6.5: Setting up, interpreting definite integrals	
(11/18: Last day to drop a course with a "W" grade.)	
11/21: 6.5: Setting up interpreting definite integrals PROJECT PRESENTATION	HW: 6.5: 13, 15, 21, 23
11/23: PROJECT PRESENTATION	
11/24: Thanksgiving – No classes	
11/28: Using fnInt on the TI-83 6.6: Average value of a function	HW: 6.6: 2, 5, 10
11/30: Consumers' Surplus (see packet notes)	HW: 7.3: 8cd (use $p_1 = \$555$); 9cd (use $p_1 = \$4000$) (For meaning of p_1 see packet notes on Consumers' Surplus)
12/1 Quiz 7	
12/5 Review for Final Exam	
12/7 Review for Final Exam	