

## MTH U131 (Calculus for Business and Economics) Fall 2007

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

**Lectures:** MWTh 10:30 AM-11:35 AM, 178F West Village Bldg

**Materials:** *Calculus Concepts (Brief Third Edition): An Informal Approach to the Mathematics of Change* by LaTorre, Kenelly, Fetta, Harris, Carpenter, Houghton Mifflin, Boston, 2007; The **TI-83 (TI-83 Plus)** or **TI-84 (TI-84 Plus)** 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 2007) must also be purchased from NU Reprographics (x2766). **Please bring your textbook, packet and calculator to each class.**

**Eduspace Course Code:** REKHA-89CA87704F6DD1

### 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 though they are not collected, you are responsible for knowing the solutions of **all** homework exercises. There is also a set of web homework exercises posted on the eduspace web site for this section. The entire set of web homework exercises will count as one quiz. Due dates for the web exercises will be announced in class. The questions on exams and quizzes will be based on homework exercises from the textbook, packet and the web, **quiz and test review exercises in the packet** and the material in my lectures.

### 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 8 quizzes (20-30 minutes each), 1 hour test (the midterm), and a 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 at the scheduled time:** December 13 at 10:30AM 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 9/21. The last date to drop a class with a 'W' is 11/16. 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<sup>-</sup>** 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 5<sup>th</sup> floor of Nightingale Hall (540B NI). Hours of operation for the fall are

**Monday through Wednesday: 10:00AM-9:00PM**

**Thursday: 10:00AM-6:00PM**

**Friday: 10:00AM-1:00PM**

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.

**Resolving disputes and complaints:** If you are not satisfied with my responses to your serious concerns (including your final course grade), please consult Prof. D. King, the course coordinator, 447 LA, x5679, e-mail: [d.king@neu.edu](mailto:d.king@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.

9/5: 3.1: average rate of change	HW:13a-c,17, 26a. Read project description in packet
9/6: 3.1 <b>QUIZ 1</b> Using the TI-83/84	HW: 12, 13d,14; packet Model Review probs 1,2 Read packet pages 33-34
9/10: 3.2; 3.3: derivatives	HW: 3.2: 7a,8, 9a,10, 17, 21, 22; 3.3: 2,5,13 3.4:1a
9/12: 4.1: slope graphs; 4.2: Deriv. Rules	HW: packet Algebra Review Probs.1-5
9/13: <b>QUIZ 2</b> ; 4.3: More Deriv.Rules	HW: 4.2: 1-6(slope equations only), 7-14 4.3: 1-6(slope equations only), 7-14
9/17: 4.2; 4.3	
9/19: 4.4: chain rule <b>PROJECT PART A DUE</b>	HW 4.4: 9, 10, 14
9/20: <b>QUIZ 3</b>	HW: 4.4: 17-26
(9/21: Last day to drop a course without receiving a "W" grade)	
9/24: 4.4: chain rule	HW: 27-37
9/26: 4.5: product rule	HW: 10-26
9/27: 4.2 ,4.3 (word problems) Using nDeriv on the TI-83	HW: 4.2: 21ab, 24, 25abcd, 26; packet Compound Interest Review Probs: 1,2
10/1: 4.4 (word problems)	HW: 4.3:16abc, 22, 23abc
10/3: <b>QUIZ 4</b> ; 4.4 (word problems)	HW: 41(ignore per cent rate of change),42ab,44, 45a
10/4: 4.5 (word problems) <b>PROJECT PART B DUE</b>	HW: 4, 28,30abcde
10/8: Columbus Day – No Classes	
10/10: 5.1: Approximating change $f(x+h)-f(x) \approx f'(x)h$ Marginal Revenue, Marginal Cost, Marginal Profit	HW: 3,5,6, 17abc, 18abc, 19abc, 20ab,25acde packet Algebra Review probs 6-12
10/11: 5.2: Optimization Notes on Optimization (class packet) Second derivative and concavity	HW: packet Optimization problems 1-10
10/15: 5.2: Optimization using the calculator	HW: 17a, 24, 29 HW: 25 (like project optimization)
10/17: Midterm Review	
10/18: <b>MIDTERM</b>	
10/22: 5.3: Inflection Points; Point of diminishing returns <b>PROJECT PART C DUE</b>	HW: 2, 29 HW: packet Optimization problems 11-14

10/24: Finding inf. pts with the TI-83/84 Anti-derivatives	HW: 5.3: 7, 9, 14 (ignore per cent rate of change), 20 Read pages 41-42 in packet
10/25: <b>QUIZ 5</b> Project group meetings on parts C and D <b>(Bring projects to class)</b> Anti-derivatives	HW: packet Anti-derivative problems 1-5
10/29: 6.4: The general anti-derivative	HW: 6.4: 9-14 HW: packet Additional Anti-derivative probs 6-11 HW: 6.4: 15, 17
10/31: 6.4: Finding a specific anti-derivative <b>PROJECT PART D DUE</b>	HW: 6.4: 19-21
11/1: 6.4: Word problems	HW: 26,27,33
11/5: 6.1: Accumulated change Area approximation by rectangles	HW: 6.1: 8ac, 13a, 18ab
11/7: <b>PROJECT PART E DUE</b> 6.2: The definite integral (see p390 and p393)	HW: 1, 4 HW: 6.4: 1-4
11/8: <b>QUIZ 6</b> Fundamental Theorem of Calculus (see p429)	HW: packet Additional Definite integral problems 1-8
11/12: Veteran's Day – No classes	
11/14: <b>PROJECT PRESENTATION</b>	
11/15: <b>PROJECT PRESENTATION</b> 6.5: Evaluating def. integrals using FTC	HW: 8c,9c,10,11c
<b>(11/16: Last day to drop a course with a "W" grade.)</b>	
11/19: <b>QUIZ 7</b> 6.5: Setting up, interpreting def. ints Using fnInt on the TI-83	HW: 13,15,21,23, 28a
11/21, 11/22: Thanksgiving – No classes	
11/26: 6.6: Average value of a function Average value of the rate of change Consumers' Surplus (see packet notes)	HW: 6.6: 2,5,10 p467: 6 HW: 7.3: 4abc
11/28: Consumers' surplus	HW: 7.3: 8cd(use $p_1=\$555$ ); 9cd(use $p_1=\$4000$ ) (For meaning of $p_1$ see packet notes on Consumers' Surplus)
11/29 <b>QUIZ 8</b>	
12/3 Review for final exam Student evaluations	
12/5 Review for Final Exam	
12/6 Reading Day	