

# MTH U131 (Calculus for Business and Economics) Fall 2006

**Instructor:** Shouxin Dai (537 NI, 617-373-5673/4, dai.s@neu.edu)

**Lectures:** **Mon, Wed, Thur 4:35pm-5:40pm at 302 KA;**

**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** (or **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 2006) must also be purchased from NU Reprographics (x2766). **Please bring your textbook, packet and calculator to each class.**

**Eduspace Course Code:** DAIZZ-13B87F23E73393

## 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 **may** occasionally be collected and graded. Even if 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. 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 call or send an e-mail to let me know. Three or more unexplained absences will lower your final grade.

## Exams

There will be 6 or 7 quizzes (20-30 minutes each), 1 hour test (the midterm), and a final exam. (Only the best 5 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, Wednesday 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 9/22. The last date to drop a class with a 'W' is 11/17. 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 5<sup>th</sup> floor of Nightingale Hall (540B NI). Hours of operation for the fall are Mon-Wed 10am-9pm, Thur 10am-6pm and Fri 10am-1pm. 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.

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.

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

10/25: Finding inf. pts with the TI-83/84 (class packet) HW: 5.3: 7, 9, 14 (ignore per cent rate of change), 20

10/26: Antiderivatives HW: packet Anti-derivative problems 1-5  
Project group meetings on parts C and D  
(Bring projects to class)

10/30: **QUIZ 4**

11/1: 6.4: Antiderivatives  
**PROJECT PART D DUE**

11/2: 6.4: Antiderivatives HW: 6.4: 9-14

11/6: 6.4: The general antiderivative HW: packet Antiderivative problems 6-10  
Finding a specific antiderivative HW: 6.4: 15, 17

11/8: **QUIZ 5** HW: 6.4: 19-21  
**PROJECT PART E DUE**

11/9: 6.4: Word problems HW: 26, 27, 33  
6.1: Accumulated change HW: 8ac, 13a, 18ab  
Area approximation

11/13: **PROJECT PRESENTATION**

11/15: **PROJECT PRESENTATION**

11/16: 6.2: The definite integral HW: 1, 4

(11/17: Last day to drop a course with a "W" grade.)

11/20: **QUIZ 6**  
6.4: Fundamental Theorem of Calculus HW: 1-4

11/22: 6.5 HW: 8c, 9c, 10, 11c  
Evaluating definite integrals using FTC packet Additional Definite integral problems 1-7

11/23: Thanksgiving – No classes

11/27: 6.5: Setting up, interpreting def. ints. HW: 13, 15, 21, 23  
Using fnInt on the TI-83  
6.6: Average value of a function  
Sign up for Makeup Midterm HW: 2, 5, 10

11/29: 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)

11/30 **Quiz 7 (if required)**

12/4 Review for final exam  
Student evaluations

12/6 Review for Final Exam

12/7 Reading Day