

## MTH U131 (Calculus for Business and Economics) Fall 2005

**Instructor:** Guangkai Shi (Math Department )  
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Office Hours: 12:30-1:30PM Wed., 3:00-5:00PM Thu., and **by appointment.**

**Lectures:** **Mon., Wed., Thurs. 1:35-2:40 PM**

**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 (Non-Honor version 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 **may** occasionally be collected and graded. 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 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.) Near the end of the semester on (December 1 or 5) there will be an opportunity to make up the midterm, provided you don't have too many unexplained absences. Details will be given later. 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: TBA.** 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 Sep. 23. The last date to drop a class with a 'W' is Nov. 18. 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). 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 chairman of the math department, Professor Robert McOwen, 505 LA, x5635, e-mail: r.mcowen@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: 11,13a-c,17,18, 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; 3.3: derivatives	HW: 3.2: 7a,8,9b,10, 17, 21, 22; 3.3: 2,4,5,13,15 3.4:1a
9/14: 4.1: slope graphs; 4.2: Deriv. Rules	HW: 4.1:1-10 (discussion only, no graphs needed),21abd; packet Algebra Review Probs.1-5
9/15: <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
9/19: 4.2; 4.3	
9/21: 4.4: chain rule <b>PROJECT PART A DUE</b>	
9/22: <b>QUIZ 2</b>	HW: 4.4: 9,10,14, 17-26
<b>(9/23: Last day to drop a course without receiving a "W" grade)</b>	
9/26: 4.4: chain rule	HW: 27-37
9/28: 4.5: product rule	HW: 10-26
9/29: 4.2 ,4.3 (word problems) Using nDeriv on the TI-83	HW: 4.2: 23-27; packet Compound Interest Review Probs: 1,2
10/3: 4.4 (word problems)	HW: 4.3:16, 22, 23abc
10/5: <b>QUIZ 3</b> ; 4.4 (word problems)	HW: 41(ignore per cent rate of change),42a,45a,48
10/6 4.5 (word problems) <b>PROJECT PART B DUE</b>	HW: 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: 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: 17a, 24
10/19: Midterm Review	
10/20: <b>MIDTERM</b>	
10/24: 5.2 5.3: Second derivative, Inflection Points; Point of diminishing returns Notes on Optimization (class packet)	HW: 25 (like project optimization); 29 HW: 2, 29 HW: packet Optimization problems 11-14

**PROJECT PART C DUE on 10/24**

10/26: Finding inf. pts using the TI-83 (class packet) HW: 5.3: 7, 9, 14 (ignore per cent rate of change), 20

10/27: Antiderivatives

Project group meetings on parts C and D  
(Bring projects to class)

10/31: **QUIZ 4**

11/2: 6.4: Antiderivatives

HW: packet Anti-derivative problems 1-5

**PROJECT PART D DUE**

11/3: 6.4: Antiderivatives

HW: 6.4: 9-14

11/7: 6.4: The general antiderivative  
Finding a specific antiderivative

HW: packet Antiderivative problems 6-10  
HW: 6.4: 15, 17

11/9: **QUIZ 5**

HW: 6.4: 19-21

**PROJECT PART E DUE**

11/10: 6.4: Word problems  
6.1: Accumulated change  
Area approximation

HW: 26, 27, 33  
HW: 8ac, 13a, 18ab

11/14: **PROJECT PRESENTATION**

11/16: **PROJECT PRESENTATION**

11/17: 6.2: The definite integral

HW: 1, 4

(11/18: Last day to drop a course with a "W" grade.)

11/21: **QUIZ 6**

6.4: Fundamental Theorem of Calculus HW: 1-4

11/23: 6.5

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

11/24: Thanksgiving – No classes

11/28: 6.5: Setting up, interpreting  
definite integrals

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

11/30: 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 (if required-check with instructor)

12/5 **MakeUp Midterm (check date with instructor)**

12/7 Review for Final Exam