

MTH U131 (Calculus for Business and Economics) Spring 2008

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 9:15 AM-10:20 AM, 157RY

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 (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 Spring 2008) must also be purchased from NU Reprographics (x2766). **Please bring your textbook, packet and calculator to each class.**

Eduspace Course Code: REKHA-F90905C6B883EA

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, future value of an income stream, 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.

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. 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. All the web exercises will be due at the end of the semester, but I suggest that you complete them as they become available. 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 9 quizzes (20-30 minutes each), 1 hour test (the midterm), and a final exam. (Only the best 7 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: April 24, 2008 at 3:30PM .** 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 approximate cut-offs for letter grades are as follows: D- (60), C-(70), B-(80) and A-(90).

The last day to drop a course without receiving a 'W' grade is 1/25. The last date to drop a class with a 'W' is 3/28. 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 spring semester 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.

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.

| MTH U131 | Schedule | Spring 2008 |
|--|-----------------|---|
| 1/7: 3.1: average rate of change | | HW: 13abc, 17, 26a. Read project description in packet |
| 1/9: 3.1 Using the TI-83/84 | | HW: 12, 13d,14; packet Model Review probs 1,2. Read packet notes on Scatter Plots and Models on the TI 83-84 |
| 1/10: QUIZ 1 3.2; 3.3: derivatives | | HW: 3.2: 7a,8, 9a,10, 17, 21, 22; 3.3: 2,5,13,15 3.4:1a |
| 1/14: 3.5: Limit definition of the derivative | | HW: 7, 13, 14, 15 |
| 1/16: 4.1: slope graphs; 4.2: Deriv. Rules | | HW: packet Algebra Review Probs.1-5 |
| 1/17: QUIZ 2 ; 4.3: More Deriv. Rules | | HW: 4.2: 1-6(slope equations only), 7-14 4.3: 1-6(slope equations only), 7-14 |
| 1/21: MLK Holiday – No classes | | |
| 1/23: 4.2; 4.3 continued | | |
| 1/24: PROJECT PART A DUE 4.4: chain rule | | HW 4.4: 9, 10, 14 |
| (1/25 - Last day to drop a course without receiving a “W” grade) | | |
| 1/28: QUIZ 3 Chain rule (contd) | | HW: 4.4: 17-26 |
| 1/30: 4.4 chain rule 4.5: product rule | | HW: 27-37 HW: 10-18 |
| 1/31: 4.5: product rule | | HW: 19-26 |
| 2/4: 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 |
| 2/6: 4.4 (word problems) | | HW: 4.3:16abc, 22, 23abc |
| 2/7: QUIZ 4 ; 4.4 (word problems) | | HW: 41(ignore per cent rate of change),42ab,44, 45a |
| 2/11: 4.5 (word problems) PROJECT PART B DUE | | HW: 4, 28,30abcde |
| 2/13: 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 |
| 2/14: 5.2: Optimization Notes on Optimization (class packet) Second derivative and concavity | | HW: packet Optimization problems 1-10 |

MTH U131 **Schedule** **Spring 2008**

2/18: President's Day – No Classes

2/20: Midterm Review

2/21: **MIDTERM**

2/25: 5.3: Inflection Points;
Point of diminishing returns
PROJECT PART C DUE

HW: 2, 29
HW: packet Optimization problems 11-14

2/27: 5.2: Optimization using the calculator
Project group meetings on parts C and D

HW: 17a, 24, 29
HW: 25 (like project optimization)

2/28: Finding inf. pts
with the TI-83/84(see packet notes)
QUIZ 5

HW: 5.3: 7, 9, 14 (ignore per cent rate of change), 20

SPRING BREAK

3/10: Anti-derivatives

HW: packet Anti-derivative problems 1-5

3/12: 6.4: The general anti-derivative

HW: 6.4: 9-14
HW: packet Additional Anti-derivative probs 6-12
HW: 6.4: 15, 17

3/13: 6.4: Finding a specific anti-derivative
PROJECT PART D DUE
QUIZ 6

HW: 6.4: 19-21

3/17: 6.4: Word problems

HW: 26,27,33

3/19: 6.1: Accumulated change
Area approximation by rectangles

HW: 6.1: 8ac, 13a, 18ab

3/20: **PROJECT REVISED PART D DUE**
6.2: The definite integral
(see p390 and p393)
QUIZ 7

HW: 1, 4
HW: 6.4: 1-4

3/24: Fundamental Theorem of Calculus (see p429) HW: packet Additional Definite integral problems 1-8

3/26: **PROJECT PRESENTATION**

3/27: **PROJECT PRESENTATION**

6.5: Evaluating def. integrals using FTC HW: 8abc,9abc,10abc,11c

(3/28: Last day to drop a course with a "W" grade.)

3/31: 6.5: Setting up, interpreting def. ints
Using fnInt on the TI-83
Area between two curves

HW: 13,15,21,23, 25, 27, 28, 29

4/2: 6.6: Average value of a function
Average value of the rate of change

HW: 6.6: 2,5,10
p467: 6

| | | |
|------|--|--|
| 4/3: | QUIZ 8 Income streams – Future Value | HW: 7.2: 5a, 10a, 14a |
| 4/7 | Income streams-Present value | HW: 7.2: 5b, 6, 10b, 14b |
| 4/9 | Consumers' Surplus (see packet notes) | HW: 7.3: 4abc |
| 4/10 | QUIZ 9 Consumers' surplus | HW: 7.3: 8bc, d (use $p_1=\$555$); 9c, d (use $p_1=\$4000$) (For meaning of p_1 see packet notes on Consumers' Surplus) |
| 4/14 | Review for final exam Student evaluations | |
| 4/16 | Review for Final Exam | |