

MATH 1231 (Calculus for Business and Economics) Fall 2009

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Office Hours: Mon. 2:45-4:15 PM, Weds. 1:45-3:15 PM, and **by appointment.**

Lectures: **Mon., Wed., Thurs. 8:00-9:05 AM, 433 RY**

Materials: *Calculus Concepts (Fourth Edition): An Applied Approach to the Mathematics of Change* by LaTorre et al, Houghton Mifflin, Boston, 2008; 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 2009) must also be purchased from NU Reprographics (x2766). **Please bring your 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, 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: MATH 1130 (formerly 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 **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 from the textbook, packet, **quiz and test review exercises in the packet** and the material in 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 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 , 2009 at . The final exam is cumulative and is common for all sections of MATH 1231. **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).** Borderline grades are determined by the final exam score.

The last day to drop a course without receiving a 'W' grade is September 29. The last date to drop a class with a 'W' grade is November 20. 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 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. Richard Porter, the department chairman, 505 LA, x5635, e-mail: r.porter@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.** Each student must check the Blackboard site for this course regularly.

9/9: 2.1: average rate of change	HW: 9, 17, 18, 22a. Read project description in packet
9/10: 2.1 Using the TI-83/84 QUIZ 1	HW: 13, 23abd, 24abc; packet Model Review probs 1,2. Read packet notes on Use of the Calculator, Scatter Plots and Models on the TI 83-84; See page 80 of textbook
9/14 2.2; 2.3: derivatives	HW: 2.2: 7,8, 9,10, 15,17,19a, 21, 22; 2.3: 2, 5,13,15, 22a
9/16: 2.4: Limit definition of the derivative	HW: 7, 9, 12, 13
9/17: 3.1: slope graphs; 3.2: Deriv. Rules	HW: 3.1: 1,5,24; packet Algebra Review Probs.1-5
9/21: 3.3: More Deriv. Rules QUIZ 2	HW: 3.2: 1-6(slope equations only), 7-26
9/23: 3.2; 3.3 continued	HW: 3.3: 1-6(slope equations only), 7-20
9/24: PROJECT PART A DUE 3.4: chain rule	HW 3.4: 9, 10, 14
9/28: QUIZ 3 Chain rule (contd)	HW:3.4: 17-26
(9/29 - Last day to drop a course without receiving a "W" grade)	
9/30: 3.4 chain rule 3.5: product rule	HW: 27-38 HW: 11-18
10/1: 3.5: product rule	HW: 19-28
10/5: 3.2, 3.3 (word problems) Using nDeriv on the TI-83	HW: 3.2: 30ab, 34, 35abc, 36; packet Compound Interest Review Probs: 1, 2
10/7: 3.4 (word problems) of change)	HW: 3.3:21abc, 22, 33abc (ignore per cent rate
10/8: QUIZ 4 ; 3.4 (word problems)	HW: 40ab, 41(ignore per cent rate of change), 42ab
10/12: Columbus Day –No classes	
10/14: 3.5 (word problems) PROJECT PART B DUE	HW: 4, 31,33abcde
10/15: 4.1: Approximating change $f(x+h)-f(x) \approx f'(x)h$ Marginal Revenue, Marginal Cost, Marginal Profit	HW: 3, 5, 6, 17abc, 18abde, 19acde,21abc, 22ab packet Algebra Review probs 6-12
10/19: 4.2: Optimization Notes on Optimization (class packet) Second derivative and concavity	HW: packet Optimization problems 1-10

10/21: Midterm Review

10/22: **MIDTERM**

- 10/26: 4.3: Inflection Points;
Point of diminishing returns
PROJECT PART C DUE HW: 2, 45
HW: packet Optimization problems 11-18
- 10/28: 4.2: Optimization using the calculator
Project group meetings on parts C and D HW: 30, 34
HW: 31 (like project optimization)
- 10/29: Finding inf. pts with the TI-83/84
QUIZ 5
Anti-derivatives HW: 4.3: 27,32 (see packet notes)
HW: packet Anti-derivative problems 1-5
- 11/2: 5.3: The general anti-derivative HW: 5.3: 9-14
HW: packet Additional Anti-derivative probs 6-12
HW:5.3: 15, 17
- 11/4: 5.3: Finding a specific anti-derivative HW: 19-21
5.3: Word problems on anti-derivatives HW: 24a
PROJECT PART D DUE
- 11/5: **QUIZ 6**
- 11/9: 5.1: Accumulated change HW: 5.1: 14a, 19
Area approximation by rectangles p375:1; and packet notes
- 11/11: Veteran's Day – No classes
- 11/12: **5.1: The definite integral** HW: 8
(see p295 and p299) HW: 5.3: 1-4
PROJECT REVISED PART D DUE
- 11/16: Fundamental Theorem of Calculus (see p340) HW: packet Additional Definite integral problems 1-8
QUIZ 7
- 11/18: **PROJECT PRESENTATION**
- 11/19: 5.4 : Evaluating def. integrals using FTC HW: 8abc,9abc,10abc,11c
- (11/20 - Last day to drop a course with a "W" grade.)**
- 11/23: **QUIZ 8**
Using fnInt on the TI-83/84
5.4: Setting up, interpreting def. ints HW: 13,15,21,23
- 11/25, 11/26 Thanksgiving – No Classes
- 11/30: Area between two curves HW:5.4:25, 27, 28, 29
5.5: Average value of a function HW: 2,5,10
Average value of the rate of change

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- 12/2: Differentials
Integration by u-substitution Packet Integration by substitution problems: 1-6
- 12/3: **QUIZ 9**
5.6: Integration by u-substitution HW: 1, 2, 5, 8, 11, 15
Packet Integration by substitution problems: TBA
- 12/7: 6.3: Consumers' Surplus (see packet notes) HW: 6.3: 8bc, d (use $p_1 = \$555$); 9c, d (use $p_1 = \$4000$)
- 12/9: Review for final exam
Student evaluations
- 12/10: Reading Day