

MATH 1231 (Calculus for Business and Economics) Fall 2014

Instructor: He Wang (wang.he1@husky.neu.edu)
(Office Hours: 10:30am-12:00pm MW at 527 Nightingale Hall)

Lectures: 9:15 am - 10:20 am MWR Shillman Hall 320

Materials:

1. *Calculus Concepts (Fifth Edition): An Informal Approach to the Mathematics of Change* by LaTorre et al, Brooks/Cole, Cengage Learning, 2012 with Enhanced Web Assign (EWA).
2. 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.**
3. A class packet (for Fall 2014) must also be purchased from NU Reprographics (x5646) located in the basement of the Ell building behind the NU bookstore. **Please bring your packet and calculator to each class.**

You have several options for obtaining the textbook and EWA:

- You can purchase the “bundle” at the NU Bookstore which includes the hardcover textbook and the access code to the EWA online homework or you can purchase the “Standalone” code that includes the ebook as an option. The second option is much cheaper. If you also want a hard cover textbook, you can probably find a used copy on line.
- You can purchase the Standalone Access Code on CengageBrain, the e-commerce website, by visiting www.cengagebrain.com. Here is the ISBN: 9781285857589
- You can purchase the Standalone Access Code directly through the WebAssign Home Page, www.webassign.net. Use the same ISBN as above.

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 future value of an income stream. (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 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. 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. **In order to get credit for doing homework you must do the corresponding exercises on line using EWA.** Your scores will be recorded automatically, and this will be the basis of your homework grade.

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. Makeup tests are available only in very special circumstances (e.g., participation in university sanctioned activities such as sports, jury duty) and are granted **only after consultation with and approval by your instructor**.

Exams

There will be 8 or 9 quizzes (20-30 minutes each), a 1 hour test (the midterm), and a final exam. (The grade 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 5-12, 2014.** 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 (25%); **EWA** homework (5%), midterm grade (15%); project grade (15%); and final exam score (40%). Borderline grades are determined by the final exam score.

The approximate cut-offs for letter grades are as follows:

Course Average	Course Grade
93-100	A
90-92	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+
73-76	C
70-72	C-
67-69	D+
63-66	D
60-62	D-
0-59	F

The last day to drop a course without receiving a 'W' grade is September 23. The last date to drop a class with a 'W' grade is November 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 policy on cheating and related disciplinary actions are detailed in the Student Handbook and at the following web site (<http://www.northeastern.edu/osccr/academichonesty.html>).

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:

Mon-Wed 10am – 8 pm,

Thurs 10-6 and

Friday 10-1.

The full schedule will start on Sept. 16th. 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.

TRACE: Every student is required to participate in the student survey known as TRACE (Teacher Rating and Course Evaluation).

Resolving disputes and complaints: If you are not satisfied with my responses to your serious concerns (including your final course grade), please consult Dr. Rekha Bai, the course coordinator, 541 LA, x5640, e-mail: r.bai@neu.edu. If Dr. Bai cannot resolve these concerns, please contact Prof. David Massey, d.massey@neu.edu, X5527.

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.**

9/3: 2.1: average rate of change	HW: 9, 17, 18, 22a. Read project description in packet
9/4: 2.1 Using the TI-84 QUIZ 1	HW: 2.1: 13, 23, 24abc; 1.11:9-12; Read packet notes on Use of the Calculator, Scatter Plots and Models on the TI 83-84; See “Choosing a Model” in textbook on page 121
9/8: 2.2; 2.3: Tangent line and the derivative	HW: 2.2: 7, 8, 11ab, 13ab, 15,17,19, 21; 2.3: 2, 5,13,14ab
9/10: 2.4: Differentiability 2.5: Limit definition of the derivative	HW: 1, 3, 15-18 HW: 1, 3, 4, 5
9/11: 2.6: slope graphs Powers and Logs (See packet)	HW: 2.6: 2, 3, 6; packet Algebra Review Probs.1-5;
9/15: 3.1: Deriv. Rules; 3.2: More Deriv. Rule; QUIZ 2	HW: 3.1: 1-27(odds), 29abc
9/17: 3.1; 3.2 continued	HW: 3.2: 1-14
9/18: PROJECT PART A DUE 3.3: chain rule	HW 3.3: 9, 10, 14
9/22: QUIZ 3 3.4: Chain rule (contd)	HW: 3.4: 1-28
(9/23 - Last day to drop a course without receiving a “W” grade)	
9/24: 3.5: product rule	HW: 1, 4, 11, 12, 13, 16, 19
9/25: - 3.6: product rule (cont’d)	HW: 1-17(odds)
9/29: Using nDeriv on the TI-84 (word problems) Word Problems (3.1, 3.2)	HW: 3.1: 31ab, 35, 36; 3.2: 21, 28 packet Compound Interest Review Probs: 1, 2
10/1: Word problems (3.3-3.6)	HW: 3.4: 34, 38, 42
10/2: QUIZ 4	HW: 3.6: 21abc, 22, 23
10/6: 4.1: Approximating change $f(x+h)-f(x) \approx f'(x)h$ 4.5: Marginal Revenue, Marginal Cost, Marginal Profit PROJECT PART B DUE	HW: 4.1: 2, 5, 7 HW: 4.5: 1, 3, 5, 7, 9, 11, 16ab, 17abc packet Algebra Review probs 6-12
10/8: 4.2: Optimization Critical points Relative and absolute extreme points First Derivative Test	HW: 4.2: 1,3,5, 9, 11, 13, 15, 21, 23
10/9: Optimization (cont.) Second derivative and concavity Second Derivative Test Notes on Optimization (class packet)	HW: 4.4: 11, 13, 15 HW: packet Optimization problems 1-10

10/15: Midterm Review

10/16: **MIDTERM**

10/20: 4.4: Inflection Points; Point of diminishing returns PROJECT PART C DUE	HW: 1, 2, 19 HW: packet Optimization problems 11-18
10/22: 4.3: Optimization using the calculator Project group meetings on parts C and D	HW: 17 (like project optimization), 20
10/23: Finding inf. pts. with the TI-84 QUIZ 5 Anti-derivatives	HW: 4.4: 30, 31 (see packet notes) HW: packet Anti-derivative problems 1-5

10/27: 5.4, 5.5: The general anti-derivative	HW: 5.4: 11-15, 18, 25, 29 HW: packet Additional Anti-derivative probs 6-12 HW: 5.5: 1, 3, 6
10/29: Finding a specific anti-derivative Word problems on anti-derivatives PROJECT PART D DUE	HW: 5.4: 19-21; 23a HW: 5.5: 21a, 22a
10/30: QUIZ 6	

11/3: Area under a curve Area approximation by rectangles	HW: 5.2: 8 Packet Area Approximation problems: 3
11/5: The definite integral (p336) Accumulated Change Properties of the definite integral (Packet Notes)	HW: 5.1: 7, 8; 5.2: 4; 5.3: 5b
11/6 Fundamental Thm of Calculus (p375)	Packet problems on Properties of def. ints: 1-4 HW: 5.6: 9

11/10: Fundamental Thm of Calculus QUIZ 7	HW: packet Additional Definite integral probs 1-7
11/12: PROJECT PRESENTATION	
11/13: PROJECT PRESENTATION	HW: packet Additional Definite integral probs 8-10

11/17: QUIZ 8 Using fnInt on the TI-84 5.6: Setting up, interpreting def. ints	HW: 14, 16
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(11/18 - Last day to drop a course with a "W" grade)

11/19: 5.8: Average value of a function Average value of the rate of change	HW: 1, 3, 5
11/20: Differentials Integration by u-substitution	Packet Integration by substitution problems: 1-6

5.9: Integration by u-substitution

HW: 1, 3, 5, 8, 11, 15, 20

Packet Integration by substitution problems: 7-19

11/26, 11/27 Thanksgiving – No Classes

12/1: Review Antiderivatives

12/3: Review for final exam
Student evaluations

12/4: Reading Day

12/5 -12/12 Final Exam Week