

Northeastern University – Course Syllabus

Math 1231

Calculus for Business and Economics

Fall 2009

<u>Class Times:</u>	Section 10:	MWTh 1:35 – 2:40 p.m.	Ryder Hall 429
	Section 11:	MWTh 4:35 – 5:40 p.m.	Ryder Hall 429
	Section 14:	MWTh 8:00 – 9:05 a.m.	Ryder Hall 158

Instructor: Howard D. Troughton

Contact Info: NI 540A 617-373-5530 h.troughton@neu.edu

Office Hours: Monday 10-11:30; Wednesday 9:30-11; Thursday 3-4; or by appointment. I can usually be found in my office between classes and I have an open-door policy, so feel free to drop by. You can also consult any other instructor of this course. A complete list of instructors and their office hours will be distributed later in the semester.

Textbook

Calculus Concepts (Fourth Edition): An Applied Approach to the Mathematics of Change by LaTorre et al, Houghton Mifflin, Boston, 2008.

There are two versions of the textbook: the full version (ISBN 978-0-618-78981-8) or the “Brief Calculus Concepts” version (ISBN 978-0-618-78982-5) which includes only the first 6 chapters of the full version but is adequate for this course.

Calculator

One of the graphing calculators from the TI-83 family (**TI-83, TI-83 Plus, TI-84 or TI-84 Plus**) is required for this course.

NO OTHER CALCULATOR MAY BE USED ON TESTS OR THE CLASS PROJECT.

This course emphasizes the conceptual aspects of calculus, so there is less emphasis placed on algebraic manipulation. Many calculations and procedures that can be done algebraically will instead be performed using the calculator. This will allow us to work with more complicated expressions and perform more complex calculations. You may continue to use algebraic manipulation for simpler problems (and are encouraged to do so), but there will be examples and exercises that will require proficiency with a calculator. During the semester I will not be able to devote much class time to teaching you these procedures – you will need to review these beforehand. I recommend that you get access to the user manual for your calculator. If you no longer have your printed manual, you can download the PDF at:

TI-83 & TI-83 Plus: www.education.ti.com/educationportal/sites/US/productDetail/us_ti83p.html?bid=6

TI-84 & TI-84 Plus: www.education.ti.com/educationportal/sites/US/productDetail/us_ti84p.html?bid=6

Class Packet

A class packet (for Fall 2009) must be purchased from NU Reprographics (x2766). Note that the class packet has changed substantially from previous semesters, so you shouldn't use one from a previous semester.

MAKE SURE TO BRING YOUR PACKET AND CALCULATOR TO EACH CLASS.

Website

Homework, course calendar, and other resources are available on Blackboard Vista. Please come and talk to me if you are unfamiliar with Blackboard Vista.

Northeastern Email

I will regularly communicate with you via email during the semester and I will assume you have received any email I send out. If your NEU email is not your primary email account you should check it on a regular basis.

Course Content

This course introduces students to the use of derivatives and integrals in solving problems in business and economics. Specific examples and applications include maximizing profit, calculating average investment income, computing future value of an income stream, and determining consumers' surplus. A class-by-class list of topics is given at the end of this syllabus. Students will complete a class project involving optimization. This project is described in more detail 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. Note that this list is subject to revision. Homework exercises should be completed before 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 and class packet, the quiz and test review exercises in the class packet, and from the material covered in lectures.

Attendance

You are expected to be present and awake in class each day. I will take attendance during each class. If for some reason, you are unable to come to a class, please make every effort to call or e-mail me to let me know. Three or more unexplained absences will lower your final grade.

Quizzes

There will be a total of 9 quizzes (20-30 minutes each) over the course of the semester. Only your best 7 quiz grades will be counted in your grade calculation.

Exams

There will be a midterm exam (full class period), and a final exam. The midterm exam is tentatively scheduled for Thursday, October 22. The final exam is cumulative and is common for all sections of MATH 1231. The final exam will be held during the final exam period, December 11 to December 18. I will announce the date when it is known.

All students without legitimate conflicts approved by the instructor will take the final exam at the scheduled time. 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%); class 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).** Final cutoffs for letter grades will be decided after the final exam is graded. Borderline grades are determined by the final exam score.

Course Withdrawals

The last day to drop a course without receiving a 'W' grade is Sep 29. The last day to drop a class with a 'W' grade is Nov 20. As a matter of Math Department policy 'incomplete' grades 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*, such as hospitalization, to complete the course requirements. An 'incomplete' may not be used to rescue a failing grade, or to postpone the final exam.

Academic Honesty

You are expected to observe the highest standards of academic integrity in this course. Please review the standards and procedures published in the Student Handbook. These are also available on the web at <http://www.northeastern.edu/osccr/academichonesty.html>. Make sure that the work you submit is in accordance with these policies. All incidents of cheating will be reported to the Office of Judicial Affairs. These incidents are investigated and adjudicated. The judicial process is a fair one with procedures for appealing decisions, and leads to substantial consequences: a deferred suspension and a fine of up to \$200 for the first offense, expulsion from the University for a second offense.

Where to Go for Calculus Help?

A free math tutoring center is 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 have a concern about the course or the instructor cannot be resolved by speaking with the instructor, please consult Prof. D. King, the course coordinator, 447LA, x5679, d.king@neu.edu. If your concern remains unresolved, contact Prof. S. Jekel (Undergraduate Advisor), 525LA, x5639, jekel@neu.edu.

Day-by-Day Class Schedule

Note that the day-by-day class schedule below is tentative. Changes may be made as 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.**

MATH 1231 – Tentative Day-by-Day Class Schedule

Date	Topics	Homework
Sep 9	2.1: Average Rate of Change	2.1: 9, 17, 18, 22a Read <i>Project Description</i> from Class Packet
Sep 10	2.1: Average Rate of Change Using the TI-83/84 QUIZ 1	2.1: 13, 23abd, 24abc; Modeling Review Problems 1, 2 (See p.80 of textbook) Read <i>Use of the Calculator and Scatter Plots and Models on the TI-83/84</i> from Class Packet
Sep 14	2.2 & 2.3: Derivatives	2.2: 7, 8, 9, 10, 15, 17, 19a, 21, 22 2.3: 2, 5, 13, 15, 22a
Sep 16	2.4: Limit definition of the derivative	2.4: 7, 9, 12, 13
Sep 17	3.1: Slope Graphs 3.2: Derivative Rules	3.1: 1, 5, 24 Algebra Review Problems 1-5
Sep 21	3.3: More Derivative Rules QUIZ 2	3.2: 1-6 (slope equations only), 7-26
Sep 23	3.2 & 3.3: continued	3.3: 1-6 (slope equations only), 7-20
Sep 24	PROJECT PART A DUE 3.4: Chain Rule	3.4: 9, 10, 14
Sep 28	3.4: Chain Rule (continued) QUIZ 3	3.4: 17-26
Sep 29	Last day to drop a course without receiving a “W” grade	
Sep 30	3.4: Chain Rule (continued) 3.5: Product Rule	3.4: 27-38 3.5: 11-18
Oct 1	3.5: Product Rule (continued)	3.5: 19-28
Oct 5	3.2 & 3.3: (word problems) Using nDeriv on the TI-83	3.2: 30ab, 34, 35abc, 36 Compound Interest Review Problems 1, 2
Oct 7	3.4: (word problems)	3.3: 21abc, 22, 33abc (ignore per cent rate of change)
Oct 8	3.4: (word problems) QUIZ 4	3.4: 40ab, 41(ignore per cent rate of change), 42ab
Oct 12	Columbus Day – No classes	
Oct 14	3.5: (word problems) PROJECT PART B DUE	3.5: 4, 31, 33abcde
Oct 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 Algebra Review Problems 6-12
Oct 19	4.2: Optimization Notes on Optimization (class packet) Second derivative and concavity	Optimization Problems 1-10
Oct 21	Midterm Review	
Oct 22	MIDTERM	

Date	Topics	Homework
Oct 26	4.3: Inflection Points Point of diminishing returns PROJECT PART C DUE	4.3: 2, 45 Optimization Problems 11-18
Oct 28	4.2: Optimization using the calculator Project group meetings on parts C and D	4.2: 30, 34 4.2: 31 (like project optimization)
Oct 29	Finding inflection points with the TI-83/84 Anti-derivatives QUIZ 5	4.3: 27, 32 (see packet notes) Anti-derivative Problems 1-5
Nov 2	5.3: The general anti-derivative	5.3: 9-15, 17 Additional Anti-derivative Problems 6-12
Nov 4	5.3: Finding a specific anti-derivative 5.3: (word problems) PROJECT PART D DUE	5.3: 19-21, 24a
Nov 5	5.3: (word problems) QUIZ 6	TBA
Nov 9	5.1: Accumulated change Area approximation by rectangles	5.1: 14a, 19 p.375: 1; and packet notes
Nov 11	Veteran's Day – No classes	
Nov 12	5.1: The definite integral (see p.295 and p.299) PROJECT REVISED PART D DUE	5.1: 8 5.3: 1-4
Nov 16	Fundamental Theorem of Calculus (see p.340) QUIZ 7	Additional Definite Integral Problems 1-8
Nov 18	PROJECT PRESENTATIONS	
Nov 19	5.4: Evaluating definite integrals using FTC	5.4: 8abc, 9abc, 10abc, 11c
Nov 20	Last day to drop a course with a "W" grade	
Nov 23	Using fnInt on the TI-83/84 5.4: Setting up, interpreting definite integrals QUIZ 8	5.4: 13, 15, 21, 23
Nov 25, 26	Thanksgiving – No Classes	
Nov 30	Area between two curves 5.5: Average value of a function Average value of the rate of change	5.4: 25, 27, 28, 29 5.5: 2, 5, 10
Dec 2	Differentials Integration by u-substitution	Integration by Substitution Problems 1-6
Dec 3	5.6: Integration by u-substitution QUIZ 9	5.6: 1, 2, 5, 8, 11, 15 Integration by Substitution Problems TBA
Dec 7	6.3: Consumers' Surplus (see packet notes)	6.3: 8bc, d (use $p_1 = \$555$); 9c, d (use $p_1 = \$4000$)
Dec 9	Review for final exam Student evaluations	
Dec 10	Reading Day	