

MATH 1231 (Calculus for Business and Economics) Spring 2024

Instructor: Vance Blankers

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Office Hours: Monday, 3-4pm; Wednesday, 12-1pm; Thursday, 9-10am. Richards Hall 115.

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).

Cengage offers a two-week free subscription trial period to access EWA, which automatically provides access to the textbook and online homework.

Cengage subscriptions are available at both the bookstore and directly from the publisher. There are two types of subscriptions available for purchase after the trial period:

- WebAssign for Latorre Standalone Access, ISBN **9781337769075**
- Cengage Unlimited
 - One semester: ISBN **9780357700006**
 - One year: ISBN **9780357700013**

Below is a link to Registration steps for WebAssign:

<https://startstrong.cengage.com/webassign-not-integrated-ia-no/>

Class Key: [neu 9360 0483](#)

2. A graphing calculator is required, and we recommend **TI-83 (TI-83 Plus)** or **TI-84 (TI-84 Plus)** calculator.

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.

Exams and Assignments:

- There will be 4 tests (1-hour each), 3 quizzes and a final exam. There will be no make-ups, but one lowest test and quiz score will be dropped.
- The questions on exams will be based on homework exercises from the textbook, packet (posted on canvas), review exercises in the packet and the material in lectures. **To get credit for doing homework you must do the corresponding exercises online using EWA.** Your scores will be recorded automatically, and this will be the basis of your homework grade.
- **All students without legitimate conflicts approved by the instructor will take the final exam at the scheduled time (April. 19-26).** The final exam is cumulative and is common for all sections of MATH 1231. Only two finals at the same time or three in one day is a university recognized legitimate reason to be excused from taking the final at the scheduled time. Students with such a conflict should complete a final exam conflict form, available on the registrar's website.

Grading: Your final grade will be determined by the following quantities:

Quizzes	In Class	6%	one lowest quiz score will be dropped
Test	In Class	30%	one lowest test score will be dropped
EWA homework	Online (www.webassign.net)	9%	Multiple trials are allowed before the due date
Project grade	Canvas Submission	15%	Group Project
Final exam score	Room will be announced later	40%	2 Hour Cumulative exam covers all the material covered during the semester

Letter grades are determined from the numerical grades as follows:

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

As a matter of Math Department policy, the **I grade** (incomplete course grade) 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). **I - grade** may not be used to rescue a failing grade, or to postpone the final.

Academic Integrity: Cheating will not be tolerated. All incidents of cheating will be reported to the Office of Judicial Affairs. You can find NU Academic Integrity Policy at the following web site
<https://osccr.sites.northeastern.edu/resources/>

Title IX: The University strictly prohibits sex or gender discrimination in all university programs and activities. Information on how to report an incident of such discrimination (which includes sexual harassment and sexual assault) is located at <http://www.northeastern.edu/titleix>

Tutoring: Please visit <https://northeasternpeertutoring.sites.northeastern.edu/> for information about free tutoring resources.

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 contact the Course coordinator, Dr. Rekha Bai (r.bai@northeastern.edu). For matters that remain unresolved, you can contact the Teaching Director, Dr. Prasanth George (p.george@northeastern.edu).

Students with Disabilities: Students who have disabilities who wish to receive academic services and accommodations should follow the standard Disabilities Resource Center (DRC) procedures found at <https://drc.sites.northeastern.edu/about-2/>

Any student with a disability is encouraged to e-mail the instructor during the first week of classes a current Memorandum of Accommodations from the Disability Resource Center.

The schedule 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 exams.**

A list of practice exercises from the textbook and class packet is attached. (This list is subject to revision). **This is not for submission.** However, you are responsible for knowing the solutions of **all** practice exercises.

Week	Schedule (Tentative)	Suggested readings and practice exercise problems (based on the section under schedule). Not for submission.
1: January 8 -11 Quiz 1 January 11	2.1: average rate of change 2.1 continued Using the TI-84	2.1: 9, 17, 18, 22a. Read project description in packet 2.1: 13, 23, 24abc; 1.11:9-12 Read Class Packet notes on Use of the Calculator, Scatter Plots and Models on the TI 83-84; Read textbook page 121
2: January 17 -18 WebAssign due 1/21	2.2; 2.3: Tangent line and the derivative 2.4: Differentiability 2.5: Limit definition of the derivative	2.2: 7, 8, 11ab, 13ab, 15,17,19, 21, 26 2.3: 2, 5,13,14ab 2.4: 1, 3, 15-18 2.5: 1, 3, 4, 5
3: January 22 -25 Test 1 January 25 PROJECT PART A DUE 1/29 WebAssign due 1/26	2.6: slope graphs 3.1 – 3.2: Deriv. Rules	2.6: 2, 3, 6; Class Packet Algebra Review Probs.1-5; Powers and Logs (See packet) 3.1: 1-27(odds), 29abc 3.2: 1-14
4: January 29 - February 1 Quiz 2 February 1	3.3 – 3.4: chain rule 3.5 – 3.6: product rule	3.3: 9, 10, 14 3.4: 1-28 3.5: 1, 4, 11, 12, 13, 16, 19 3.6: 1-17(odds)
5: February 5 - 8	Using nDeriv on the TI-84 (word problems) 3.1 – 3.6: Word Problems 4.1: Approximating change $f(x + h) - f(x) \approx f'(x)h$	3.1: 31ab, 35, 36; 3.2: 21, 28 3.4: 34, 38, 42 3.6: 21abc, 22, 23 4.1: 2, 5, 7
6: February 12 – 15 Test 2 February 15 PROJECT PART B DUE 2/16 WebAssign due 2/20	4.5: Marginal Revenue, Marginal Cost, Marginal Profit 4.2: Optimization Critical points, Relative and absolute extreme points, First Derivative Test	4.5: 1, 3, 5, 7, 9, 11, 16ab, 17abc packet Algebra Review problems 6-12 4.2: 1,3,5, 9, 11, 13, 15, 21, 23
7: February 21 - 22	4.2: Optimization (cont.) Second derivative and concavity Second Derivative Test, Notes on Optimization (Class Packet)	4.4: 11, 13, 15 Class Packet Optimization problems 1-10,

8: February 26 - 29 PROJECT PART C DUE 3/1	4.4: Inflection Points; Point of diminishing returns 4.3: Optimization using the calculator Finding inf. pts. with the TI-84	4.4: 1, 2, 19 Class Packet Optimization problems 11-18 4.3: 17 (like project optimization), 20 4.4: 30, 31 (see packet notes)
9: March 11 – 14 Test 3 3/14 PROJECT PART D DUE 3/15	5.4, 5.5: Antiderivatives , The general anti-derivative Finding a specific anti-derivative Word problems on antiderivatives	Class Packet Anti-derivative problems 1-12 5.4: 11-15, 18, 19-21; 23a, 25, 29 5.5: 1, 3, 6, 21a, 22a
10: March 18 – 21 WebAssign due 3/17	Area under a curve, Area approximation by rectangles The definite integral (p336)	5.2: 1-4, 8 Class Packet Area Approximation problems 5.1: 7, 8 5.3: 5b
11: March 25 – 28 Test 4 March 28	Properties of the definite integral (Packet Notes) Fundamental Theorem of Calculus (p375) Using fnInt on the TI-84 5.6: Setting up, interpreting def. integrals	Class Packet problems on Properties of def. integrals: 1-4 5.6: 9 – 12 Class Packet Additional Definite integral problems 1-10
12: April 1 – 4 Quiz 3 April 4	5.8: Average value of a function Average value of the rate of change	5.6: 14, 1 5.8: 1, 3, 5 Class Packet Average Value problems
13: April 8 – 11 WebAssign due 4/10 PROJECT PRESENTATIONS	5.9: Integration by u-substitution	5.9: 1, 3, 5, 8, 11, 15, 20 Class Packet Integration by substitution problem 19
14: April 17	Review for the Final Exam, student evaluations.	Class Packet Final Review

Quiz 1 January 11
Test 1 January 25
Quiz 2 February 1
Test 2 February 15
Test 3 March 14
Test 4 March 28
Quiz 3 April 4

WebAssign due dates:
January 21
January 26
February 20
March 17
April 10

Project due dates:
Part A January 29
Part B February 16
Part C March 1
Part D March 15
Part E Presentation 4/8 to 4/11

January 29: Last day to drop a class without a W grade

February 1: Last day to file a Final Exam Conflict Form