Math 102 – Calculus I with Econonomics Applications
Course Policies

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TENTATIVE OFFICE HOURS:
Monday 3:30–4:30
Wednesday 3:30–4:30
Thursday 2:00–3:00
Friday 10:30–11:15
And by appointment (Really!)

TEXT: *Calculus from Graphical, Numerical, and Symbolic Points of View, Vol 1, 2nd Edition* by Ostebee and Zorn

Overview

Very few things in this world are constant – Most things change: public opinion; your annual income; the speed of a car; your eating habits. Calculus is the language of change. It allows us to describe and predict the behavior of changing *quantities.*

One of the recurring themes throughout the semester will be the process of approximation: Although you may not be able to find a solution exactly, in most cases a good approximation serves just as well. One of the beautiful aspects of calculus is that quite often, by taking better and better approximations we can find a precise solution.

This course forms a connection with Econ 102 Introduction to Microeconomics as part of Wheaton's General Education Curriculum that goes into affect this fall. We will pay special attention to applications of calculus to microeconomics, but you can certainly take this class without being enrolled in Econ 102. First and foremost, this is a calculus course. We will cover the same mathematical content as Math 101 Calculus I, including the more standard applications of calculus in the sciences. Whether you are a math major, a science major, or an economics major, this course will prepare you for further studies that depend upon the material in Calculus I.

Course Goals and Expectations

Two of the goals of this course are that you learn to read a math text and that you learn to communicate mathematics with other students. Mathematics is a very personal discipline that is best learned by *doing* rather than by observing.

Therefore, the class will be structured with some lectures to emphasize particular topics, but much of the time will be spent on in-class work. You will have a reading assignment for nearly every class meeting, and it is **extremely** important that you complete the reading before the next class meeting! The class meetings are not intended to be a complete encapsulation of the course material, but instead will focus on the major concepts from the reading and clarifying the more subtle ideas of the reading.

You should expect to put in approximately 2 hours outside of class for each hour in class. In other words, expect to spend at least 8 hours per week on Calculus I outside of class. There will be some weeks where you spend more time (e.g. working on projects or preparing for exams), and there may be some weeks where you do not spend the full 8 hours.

Evaluation

Your final grade will be determined by

Reading Assignments	5%
Two Group Projects	20%
Three In-Class Exams	40%
Differentiation Exam	10%
Comprehensive Final Exam	15%
Homework	10%

Working with Other Students

Many of the assignments this term will be group assignments where you will work in groups of two or three (of your choosing). Each assignment will receive a grade, and the group will determine how the points are allocated to each member. For example, if a group of three receives an 85 on an assignment, then the group will have $3 \times 85 = 255$ points to distribute among them. I will be available to mediate this process, if necessary.

Reading Assignments

I will put a copy of each reading assignment on the Math 102 homepage (linked from my homepage). Each assignment will indicate which parts of the section are especially important and which can be skipped. Each assignment will also have two or three questions that you should be able to answer after you have read the section.

See the *Guidelines for Submitting Reading Assignments* and *Suggestions for Reading a Math Book* on the course web page for more information.

Group Projects

There will be two group projects assigned during the semester. You will have two class periods to work together on each project, and your written report will be due a week or so later (see the syllabus for specific dates).

One of the main goals of the projects is that you learn to communicate mathematics *precisely*, both verbally with your group and in writing. The reports should be written in complete sentences explaining the results and major ideas involved. You may divide the writing of the report in whatever way is agreeable to the group, but everyone should completely understand the whole of the paper. Further, each member should proofread the entire paper for consistency and typos.

For the first project, I will collect a first draft and make comments on it before the final version is due. I will give you a handout that explains my expectations for the written reports in more detail.

Exams

The dates for the exams are given on the syllabus on the course web page. I will give you a set of sample problems before each exam, and we will have a question and answer session before each exam to discuss the sample problems. For each exam, you will be allowed to bring an 8.5"$\times$11" piece of paper, handwritten on one side, which you will turn in with the exam. The Final Exam will be comprehensive and will have both an inclass and a takehome component.

Differentiation Exam

One of the fundamental skills you will learn this semester is differentiation, or finding an algebraic expression for the rate of change of a function. The Differentiation Exam will consist of five or so problems and is graded with no partial credit. You either get every problem correct, or you get no credit for the exam. However, you may retake a similar exam as many times as you need until you pass.

The Differentiation Exam will be given in class on October 24. If you pass the Exam (or any version of it) on or before November 3, you will receive the full 10% credit. After that date (until the end of classes) you will receive 5%. You are not allowed to take the exam after the end of classes.

Homework

The purpose of the homework assignments is to help you understand the concepts of the course and master the computational aspects of calculus. The homework will be the most beneficial to you if you work on it throughout the week, not just on the few days before it is collected on Thursday.

Some Thursdays you will have assignments that won't be collected (such as on exam days), but it will still behoove you to complete the problems. An advanced math major will grade three or four problems from each assignment, with each problem graded fairly leniently and assigned a score of $0 - 3$. The most important aspect of the homework is that you make a serious effort on every problem.

The homework assignments will alternate between Individual assignments and Group assignments. For the Group assignments, *each* student should attempt *all* of the homework problems, and the group should meet to complete the assignment. Each group will turn in one paper with one student designated as the primary author who writes-up the solutions for that assignment. **The role of primary author must rotate among the members of the group.**

You may discuss the Individual assignments with other students, but each person must turn in a separate paper that represents his/her own work.

Here are a few guidelines for the presentation of your homework. If you do not follow these, I reserve the right to return your homework ungraded!

- Be sure to label the primary author on the group assignments.
- Your writing must be clear and legible.
- Your homework should be well-written, using complete sentences to justify your results where necessary. *A list of answers without explanation is not acceptable.*
- Here is a good rule of thumb to follow when writing up your homework:

  > Write your solutions so that you could hand them to a student in a different section of Calc I and she could understand your explanation.

- If you write in pen, there should be no scratch-outs.
- Do not turn in paper torn from a spiral notebook with ragged edges.
- Clearly label each problem.

In order to give you some time to look over your assignment after you have asked questions, I will leave 10 minutes of class on Monday for homework questions.

The homework is due in my office by 3:00 on Thursday. Be aware that

Late homework is not accepted!! No exceptions!!

You will be allowed to drop one homework assignment at the end of the semester.

The Honor Code

Remember that we are operating under the Honor Code for all of your academic work while you are at Wheaton, and I take this quite seriously. This carries freedoms and responsibilities for both you as students and me as the professor. The best approach is to avoid any situation where there is a great temptation to violate the Honor Code, or if you find yourself in this position, remove yourself from it.

At the Faculty Meeting on March 7, the Wheaton faculty approved a resolution that all students should write out, and sign, the following statement on all course work:

> "I have abided by the Wheaton College Honor Code in this work."

Class Attendance

Although class attendance is not a specified percentage of your grade, I will keep a class roll to help me determine borderline grades at the end of the semester. If you do miss class, you are responsible for the material that was covered.

Getting Help

Please come see me during my office hours! If you have a conflict and cannot make my office hours, please call or email me and we can set up an appointment for another time.

Tentative Syllabus

All numbers indicate sections from Ostebee/Zorn, Volume 1, Second Edition.

Monday	Wednesday	Thursday	Friday
	9/3 Welcome to Math 102	9/4 Introduction to Maple	9/5 1.2 Graphs
9/8 1.3 Elementary Functions	9/10 1.4 The Idea of the Derivative	9/11 More with plots in Maple *Indiv HW Due*	9/12 1.5 Estimating Derivatives
9/15 1.6 The Geometry of Derivatives	9/17 1.7 The Geometry of Higher-Order Derivatives	9/18 Project 1 *Group HW Due*	9/19 Project 1
9/22 1.7 continued	9/24 2.1 Defining the Derivative	9/25 Working with the difference quotient *Indiv HW Due* *Project 1 Draft Due*	9/26 2.2 Derivatives of Power Functions and Polynomials
9/29 2.3 Limits	10/1 The Big Picture	10/2 Exam 1 Covers thru 2.2	10/3 2.4 Using Derivative and Antiderivative Formulas
10/6 2.6 Derivatives of Exponential and Logarithmic Functions	10/8 2.6 continued	10/9 Practice differentiation *Group HW Due*	10/10 2.7 Derivatives of Trig Functions *Project 1 Due*
10/13 Fall Break	10/15 3.1 The Product and Quotient Rules	10/16 Practice differentiation *Indiv HW Due*	10/17 3.2 Composition and the Chain Rule
10/20 3.2 continued	10/22 More Differentiation	10/23 Putting it all together *Group HW Due*	10/24 Differentiation Exam
10/27 4.3 Optimization	10/29 4.3 continued	10/30 Project 2 *Indiv HW Due*	10/31 Project 2
11/3 4.7 Taylor Polynomials Last day for full credit on Diff Exam	11/5 The Big Picture	11/6 Exam 2 Covers thru 4.3	11/7 4.7 continued
11/10 4.8 Why Continuity Matters	11/12 4.9 Why Differentiability Matters	11/13 The temp at the equator & the IVT *Group HW Due*	11/14 5.1 Areas and Integrals *Project 2 Due*
11/17 5.2 The Area Function	11/19 5.3 The Fundamental Theorem of Calculus	11/20 The FTC and economics *Indiv HW Due*	11/21 5.3 continued
11/24 5.4 The Method of Substitution	11/26 Thanksgiving	11/27 Thanksgiving	11/28 Thanksgiving
12/1 5.4 continued	12/3 The Big Picture	12/4 Exam 3 Covers thru 5.4	12/5 5.6 Approximating Sums
12/8 5.6 continued	12/10 TBA	12/11 TBA *Group HW Due*	12/12 Course Overview

Final Exam Wednesday December 17, 9:00–12:00