Math 236 – Multivariable Calculus – Course Policies

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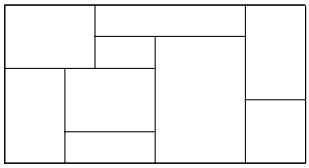
Tentative Office Hours:	Monday 2:00–3:00 Wednesday 2:00–3:00 Thursday 12:15-1:15 pm Friday 11:30–12:15 **And by appointment** (Really!)
Text:	*Multivariable Calculus from Graphical, Numerical, and Symbolic Points of View, Revised Preliminary Edition* by Ostebee and Zorn

Overview

This course is a continuation of the topics covered in Calculus I and Calculus II. In Calc I and II, you dealt mainly with functions $f(x)$ of one variable. As you may expect, in Multivariable Calculus we'll be studying functions $f(x, y)$ of two variables, where things suddenly become much more complicated, and much more interesting.

Many of the topics we will cover this semester allow us to solve many problems that do not seem to be immediately related to calculus. Here is one of my favorites:

> Many small rectangles are combined to form one large rectangle. If each small rectangle has one pair of sides of integer length (but not necessarily both pair of sides), does the large rectangle have one pair of sides with integer length?



Reading the Text and Working with Other Students

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

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.

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! See the section below on Reading Assignments and the *Guidelines for Submitting Reading Assignments* on the course web page for more information.

Evaluation

Your final grade will be determined by

Two Exams	30%
Comprehensive Final Exam	15%
Three Major Projects	30%
Homework	20%
Reading Assignments	5%

Exams

On each of the two exams, there will be a short inclass part and a more substantial takehome part. The Final Exam will be entirely takehome. See the Tentative Syllabus for the dates of the exams.

Major Projects

There will be two group writing projects and an individual Maple project assigned during the semester. You will have one or two class periods to work together on each group project, and your written report will be due about a week and a half later (see the syllabus for specific dates). I will give you the individual project with plenty of time to complete it.

One of the main goals of the writing 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. I will give you a handout that explains my expectations for the written reports in more detail.

Homework

Homework will be collected most Fridays, and I will grade four problems from each assignment. Each problem will be receive a score between 0 and 5, and I will give you solutions to the entire assignment.

The homework assignments will vary between Individual assignments and Group assignments. For the Group assignments, each group will turn in one paper. On each assignment, one student will be designated as the primary author who writes-up the solutions. **The role of primary author must rotate among the members of the group.**

For the Individual assignments, I encourage you to work with other students, but each person must turn in a separate paper.

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!

- 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 another student in the class 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. Scissors are a mature technology that you can use to solve this problem.

- Clearly label each problem.

The homework is due in my office by 2:00 on Friday. Be aware that

Late homework is not accepted!! No exceptions!!

One comment about Ostebee/Zorn, which I'm sure you already know:

The text believes that you can think.
There will not be an example worked exactly like every homework problem.

Reading Assignments

I will put a copy of each reading assignment on the Math 236 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 three (or so) questions that you should be able to answer after you have read the section.

See the *Guidelines for Submitting Reading Assignments* on the course web page for more information.

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 *Multivariable Calculus* by Ostebee/Zorn

Monday	Wednesday	Friday
1/27 Welcome to Multi §1.1 Three-dimensional space	1/29 Appendix A Polar coordinates	1/31 §1.2 Curves and parametric equations
2/3 §1.2 (cont.)	2/5 §1.3 Vectors §1.4 Vector-valued functions	2/7 §1.4 (cont.) *Group HW Due*
2/10 §1.5 Derivatives, antiderivatives, and motion	2/12 Work on Project 1	2/14 §1.6 The dot product *Individual HW Due*
2/17 §1.6 (cont.) §1.7 Lines and planes in three dimensions	2/19 §1.8 The cross product	2/21 §2.1 Functions of several vars §2.2 Partial derivatives *Group HW Due*
2/24 §2.2 (cont.) **Project 1 Due**	2/26 §2.3 Partial derivatives and linear approximation	2/28 **Exam 1 Inclass** *Individual HW Due*
3/3 §2.4 The gradient and directional derivatives	3/5 §2.4 (cont.)	3/7 §2.5 Local linearity: theory of the derivative **Exam 1 Takehome Due**
3/10 §2.7 Maxima, minima, and quadratic approximation	3/12 Work on Project 2	3/14 Work on Project 2 *Group HW Due*
3/17 Spring Break	3/19 Spring Break	3/21 Spring Break
3/24 §2.8 The chain rule	3/26 §3.1 Multiple integrals and approximating sums	3/28 §3.2 Calculating integrals by iteration *Individual HW Due*
3/31 §3.2 (cont.) **Project 2 Due**	4/2 Appendix B Calculus in polar coordinates	4/4 Appendix B (cont.) *Group HW Due*
4/7 §3.3 Double integrals in polar coordinates	4/9 §3.3 (cont.)	4/11 **Exam 2 Inclass** *Individual HW Due*
4/14 §5.1 Line integrals	4/16 §5.1 (cont.)	4/18 §5.2 More on line integrals: a fundamental theorem **Exam 2 Takehome Due**
4/21 §5.2 (cont.)	4/23 §5.3 Relating line and area integral's: Green's theorem	4/25 §5.3 (cont.) *Group HW Due*
4/28 The Big Picture on Line Integrals	4/30 Course Overview	5/2 Show & Tell **Individual Project Due** *Individual HW Due*

Takehome Final Exam Due Tuesday, May 6, at 4:00 pm