

# Math 251H, Fall 2003

## Multivariable Calculus

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<b>Lectures:</b>	MWF, 8:45-9:50am MP401
<b>Text:</b>	“Calculus”, Fourth Edition, by James Stewart, Chapters 13-17
<b>Additional Resources:</b>	“A MATLAB Companion for Multivariable Calculus”, by Jeffery Cooper, or “Mastering MATLAB 6” by D. Hanselman and B. Littlefield.
<b>Prerequisite:</b>	Math 152 with a grade of C or better
<b>Office Hours:</b>	W 2-3, F 11-12 <i>and by appointment</i> . If you cannot come to my office hours <i>please</i> contact me in class or by email/phone to set up a time to meet. Also, you can ask me questions by email/phone.
<b>Calculators:</b>	No calculators will be allowed on exams. Although you won't need to, you can use a scientific calculator for homework.
<b>Tutoring:</b>	For additional tutoring help the Learning Resource Center operates the Mathlab (x 5-2444 for more details). Also, a list of private tutors will be posted in the Math Dept.

### Academic Misconduct

I will not tolerate cheating in any form. Giving or receiving aid on exams or copying of homework will result in a grade of zero for the exam or homework. Here is a summary of UMBC's official policy on academic misconduct:

By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Conduct Policy, consult the *UMBC Student Handbook*, the *Faculty Handbook*, or the UMBC Policies section of the *UMBC Directory*.

## Grading

**Grades:** Homework 15%, Projects 10%, Three Midterm Exams, 15% each, Final 30%

**Homework:** There will be required and recommended homework problems assigned each day in class. I will keep a list on my web page too. *Required problems* assigned on MWF will be due at the *start* of class the following Monday. At least some of them will be graded. Make sure your homework paper is *stapled*. *Recommended problems* will not be graded. However, since the only way to learn math is to do it, you are expected to do the recommended problems, and they may appear on the exams. *No late homework will be accepted!* Your lowest two homework grades will be dropped. You may ask me questions about the homework and you may collaborate with another student in the class. In fact you are encouraged to do so! However the final write up is your own – *two identical homework papers will both be given zero*.

**Projects:** There will be one project to be done in groups of two and worth 6% of your grade. The project will involve a combination of both “paper and pencil” math and numerical computation using MATLAB. MATLAB is a mathematical software package that is widely used in science and engineering and is available on many UMBC computers. In class, I will demonstrate how to use it. More details soon. In addition there will be four extended numerical homework-type problems, one on each of Chapters 13-16, which will require you to use MATLAB. Each of these problems will be worth 1%.

**Midterm Exams:** There will be three midterm exams.

- Midterm 1: Monday 29th Sept, on Chapters 13-14. (Graded homework will be returned to you by Wed 24th.)
- Midterm 2: Friday 24th October on Chapters 15-16.2 (Graded homework will be returned to you by Wed 22nd.)
- Midterm 3: Wednesday 26th November on Chapters 16.3-17.5. This exam is the day before Thanksgiving. You are expected to be there! Homework normally due on Monday 24th Nov. will be due Friday 21st Nov. and will be handed back in class on Monday 24th.

**Final Exam:** Monday 15th December 8-10 am in MP 401. The final will be based on the whole course. Some questions may be more difficult than those on the midterms.

## How I assign final grades

For each exam I work out how many points I expect a student who has a solid understanding of the material to get. I tend to put the bottom B near this score. Then I work out where to place the bottom A,C,D using the grade distribution and by looking at individual exams. I also work out the bottom A,B,C,D for the homework, labs and projects. Then I take an imaginary student who got the bottom B (say) for each component of the course and

calculate their score. If your score is higher than the imaginary student's you get a B. If it is a little less than the imaginary student's score I look carefully at your work to decide whether you deserve a B or a C. Most importantly I look at your final exam. Typically one or two students do much better on the final exam than on the other components of the course. If a student has a mid C grade going into the final but writes a mid to high B final I will probably give them a B for the course. *Also students who do very poorly on the final might find that their course grade is lower than they had expected!*

As you can see I place quite a bit of emphasis on the final exam. In short I reward "strong finishers" who can show me they have a solid understanding of the entire course.

## Advice for Homework

1. If you get stuck on a problem get help and get it before you waste too much time!! Here are some places you can go for help.
  - Carefully read the book (again!).
  - Ask me for help by email or in person.
  - Ask a fellow class member – sometimes two heads are better than one!
  - Sleep on it. Some of my best ideas come when I wake up in the morning.
2. My Dad used to say "You can't do maths on a postage stamp", so use lots of paper. Write your solutions up neatly *after* working out the problem on scrap paper.
3. I'll teach you by example how to write up your solutions in a connected step-by-step fashion with explanatory sentences. You should aim to write up solutions so that you'll easily understand them in a month's time when you're studying for the exam!
4. Some of the homework problems will be harder than others. Don't expect to solve them all on the first try!
5. Never start your homework the day before it is due!!
6. You should spend *at least* 10-12 hours a week on this course outside of class time.

## Advice for Exams

**Types of Questions:** The exams will test whether you have mastered the basic concepts and methods of calculation as well as whether you can apply your knowledge to solve problems. *You will not get any credit for an answer unless you also show how you arrived at that answer.* Some questions will be similar to homework and review questions. Others will look somewhat different from those you have seen before and will test whether you really understand the concepts we have discussed in class. Some questions will involve *written explanations*.

**Review for exams:** I will suggest practice problems before each exam. If there is sufficient interest I may hold a review sessions.

**Making up an exam you missed:** If you miss one of the 3 midterms you *may* be given

the chance to take a make up exam. To request a make up you should speak with me **no later than 48 hours after** the exam time. Generally speaking, you will be offered a make up if you are sick or if a close relative or friend is gravely injured/sick or dies. However I will listen to all reasonable requests. Be prepared to bring appropriate evidence in support of your request. There will be no make ups for the final exam.

## How to succeed in the course

This is a very fast paced course and new material is always built on older material. In my opinion to succeed in the class you *must* do the following.

1. Attend class every MWF. A study in the Math Dept at the University of Texas has shown that for every class a student misses their grade falls by about 10%.
2. If you do miss class contact me *asap* to find out how to catch up.
3. Begin each hwk assignment *the same day* that we cover the material in class. If you do this you will understand the next lecture much better!
4. Read each section of the book the day *before* we cover it in class.
5. I encourage you to *ask questions* both in and out of class. If you are dazed and confused most likely most of your class mates are too! So you'll be doing everyone a favor by asking your question.
6. Come and talk with me in my office.
7. Learn the art of taking good notes.
8. Do *all* the hwk problems. Work out what your mistakes are on the graded hwk and learn from them.
9. Talk math with your fellow students, don't work in isolation.