Math 2415, Fall 2012
Calculus of Several Variables

Course Information

85578  Math 2415.003  TuTh 11:30-12:45  GR 3.302
85580  Math 2415.005  TuTh 4:00-5:15  GR 3.302

Professor Contact Information

Instructor:    John Zweck
Office:        FO 3.704J
Email:         zweck@utdallas.edu; jwz120030@utdallas.edu
Webpage:       I will maintain a web page for the course, linked from my web page
                http://www.utdallas.edu/~jwz120030. Bookmark it! I will also com-
                municate with you using a class email list. (I do not use eLearning.)
Phone:         TBD (Do not leave a message. Email me instead.)
Office Hours:  Tu 3-4, Th 1-2 and by appointment. If you cannot come to my office
               hours please contact me in class or by email to set up a time to meet.
               Also, you are encouraged to ask me questions by email.

Course Pre-requisites and Co-requisites

Pre-requisites:  A grade of C- or better in MATH 2414 or equivalent
Preparation:    In general, success in Math courses strongly depends on your grade
                in previous relevant courses. For Math 2415, the material in Math
                2413 (Calculus I) is much more important than that in Math 2414
                (Calculus II).
Co-requisites:   Students must be enrolled in one of the following problem sessions:

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<tr>
<th>Section</th>
<th>Class</th>
<th>Days</th>
<th>Time</th>
<th>Room</th>
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<td>84870</td>
<td>Math 2415.301</td>
<td>M 9:00-10:50</td>
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<td>W 3:00-4:50</td>
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Students must be enrolled in one of the following exam sections (see below for exams dates):

84869 Math 2415.701 F 2:00-4:45 SLC 2.303 or CN 1.120

Course Description

Continuation of the Math 2413, 2414 sequence. The course covers differential and integral calculus of functions of several variables. Topics include vector valued and scalar functions, partial derivatives, directional derivatives, chain rule, Lagrange multipliers, multiple integrals, double and triple integrals, the line integral, Green’s theorem, Stokes’ theorem, Divergence theorem.

Student Learning Objectives/Outcomes

See Course Objectives for Math 2415 on my web page. This is actually fun to read: You’ll learn what Math 2415 has to do with the wire-frame sculptures of Alexander Calder and with Maxwell’s equations that describe the propagation of light!

Required Textbooks and Materials

Text: “Calculus (Early Transcendentals)”, Seventh Edition, by James Stewart, Chapters 12-16; A less expensive Electronic Version is also available.

Calculators: No calculators will be allowed on exams. Although you won’t need to, you can use a scientific calculator for homework.


Online Resources: I encourage you to make use of the online video lectures and other resources developed by MIT and the Khan Academy

Academic Calendar and Assignments

The Course Schedule and Homework Assignments are available on the my web page.

Study Plan Essay

Due at start of class on Tuesday August 30th.
Homework

There is a strong correlation between homework grades and performance on exams. There will be required and recommended homework problems posted on the course web page for each day of class. Required problems assigned on TuTh will be due at the start of class the following Thursday. 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 some of them will appear on the exams!

Grading Policy

Grades: Study Plan 0%, Active Participation in Problem Sessions 5%, Homework 15%, Midterm One 25%, Midterm Two 25%, Final 30%

Study Plan Essay: Students who do not complete this assignment will receive a grade of ZERO for all homework for the entire course.

Participation: The Teaching Assistant will give you a grade between 0 and 5 depending on the degree to which you actively participate in small group learning experiences in the Problem Sessions.

Homework: Your lowest two homework grades will be dropped.

Midterm Exams: There will be two midterm exams, each two hours.

- Midterm 1: Friday Oct. 5th, from 2:00-4:00, on 12.1-12.6, parts of 15.7 and 15.8, 13.1-13.3 (excluding curvature), 14.1, 14.3, and 14.4.
- Midterm 2: Friday Nov. 9th, from 2:00-4:00, on 14.5-14.8, part of 16.6, 15.1-15.4, 15.10, 16.1, 16.2.

Final Exam: Friday Dec. 14th, from 2:00-4:30. The final will be based on the whole course and will be 2 hours 30 mins.

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. 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. To decide on the grades of borderline students I look carefully at performance on the final exam. In brief, I reward “strong finishers” who can show me they have a solid understanding of the entire course.
Instructor Policies

Homework

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. I do not encourage large groups of people to work together on homework. Do not miss class to complete a homework. I will not accept homework that is handed in after the first few minutes of class.

Making up an exam you missed

If you miss one of the midterms you may be given the chance to take a make up exam. To request a make up you should contact 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.

Academic Integrity

I will be vigorous in reporting all instances of cheating to the University administration. See http://www.utdallas.edu/deanofstudents/dishonesty/

UT Dallas Syllabus Policies and Procedures

The information at http://go.utdallas.edu/syllabus-policies constitutes the University’s policy and procedures segment of the course syllabus.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.

Study Tips

1. Read the results of a survey I did on Study Habits and the Transition from High School to University and find a strategy that works for you.

2. Attend class every day. Do not skip the second half of class. 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%.

3. Learn the art of taking good notes. My lectures usually present a complementary perspective on the subject to that in the textbook. I test what I teach! So you need a detailed record of what was discussed in class.

4. You should spend at least 10-12 hours a week on this course outside of class time.

5. 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!
6. **Warning:** This course gets harder as the semester progresses. My experience is that student who receive a C on the midterms are in grave danger of getting D/F on the final and in the course. **To do as well as you can, I strongly encourage you to come to see me with specific questions on a regular basis.**

7. On the course web page I will post the sections that we will cover each day. **You are expected to read the section ahead of time.**

8. It is very important to keep the main definitions, statements of theorems, and simpler examples in the forefront of your mind throughout the course, since we will refer back to them many times. You will need to digest the material several times to master it — before class, in class, reading through material after class, rederviving for yourself without any aid results discussed in class, and doing the assigned problems.

9. This is a fast paced course. Do not get behind. Do not miss class. If you miss a class or start to get lost, it will only be a week before you are totally lost. So ask for help from me and from your fellow students immediately!

10. 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.

11. In class I call on people by name to answer questions. This is to keep you involved and helps me find out whether you are understanding what’s going on. **If you do not feel comfortable being called on in class, please come and talk with me, and we will find another way to actively involve you.**

12. Come and talk with me in my office. Talk math with your fellow students, don’t work in isolation.

**Advice for Homework**

1. **Never start your homework the day before it is due!!**

2. Do all the hwk problems. Work out what your mistakes are on the graded hwk and learn from them.

3. 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 – often two heads are better than one! I encourage you to find a study partner and/or actively participate in a study group. First attempt the hwk yourself, then discuss them with your study partner, and finally carefully write the solutions up in your own words.
   - Sleep on it. Some of my best ideas come when I wake up in the morning.

4. 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. Apart from anything else, this helps you organize your thoughts and therefore learn the material better.

5. 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!**

6. Some of the homework problems will be harder than others. Don’t expect to solve them all on the first try!
7. If your homework grades are not as high as you’d like you should arrange to meet with me for 15 minutes at a fixed time each week. We will use this time to discuss what you did wrong on past homeworks and also check how you are doing on the current homework. Don’t wait until exam time!

**Advice for Exams**

A large collection of past exams are on the course web page together with some solutions. *Do as many as you can!*

Exams will include problems similar to those in the homework and in lectures as well as examining theory covered in class (definitions, theorems, concepts, examples). *You will not get any credit for an answer unless you also show how you arrived at that answer.* Some questions will be similar or even identical to homework questions. Others will look a little different from those you have seen before and will test whether you really understand the concepts we have discussed in class. At least one question on each exam will involve written explanations of the theory we discuss in class. For example, I may ask you to explain some of the more important fundamental concepts or to carefully state some of the most important theorems.

I encourage you to first master the theory and memorize calculation methods and formulae you need to know and then use this knowledge to work a range of problems without looking at your notes. To learn theory, calculation methods, and formulae go through your notes and the book and write down a detailed list of topics you need to know. Then with your lecture notes and book closed write down what you know about each topic, as precisely and succinctly as you can. Only when you get stuck should you look at your lecture notes. If you do this about 4 times in the 10 days prior to the exam you should be in good shape. Don’t forget to work lots of problems as well!

You should also spend some but not all of your preparation time studying in small groups to learn from each other. Presenting material to someone else is often the best way to work out whether you really know it yourself.