Math 2415, Fall 2014
Calculus of Several Variables

Course Information

<table>
<thead>
<tr>
<th>Section</th>
<th>Course</th>
<th>Days</th>
<th>Time</th>
<th>Room</th>
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</thead>
<tbody>
<tr>
<td>83803</td>
<td>Math 2415.001</td>
<td>TuTh</td>
<td>10:00-11:15</td>
<td>GR 3.302</td>
</tr>
<tr>
<td>85619</td>
<td>Math 2415.004</td>
<td>TuTh</td>
<td>4:00-5:15</td>
<td>GR 2.302</td>
</tr>
</tbody>
</table>

Professor Contact Information

Instructor: John Zweck
Office: FO 3.704J
Email: zweck@utdallas.edu
Webpage: I will maintain a web page for the course, linked from my web page [http://www.utdallas.edu/~zweck](http://www.utdallas.edu/~zweck). Bookmark it! I will also communicate with you using a class email list. (I do not use eLearning.)
Phone: 972-883-6699 (Do not leave a message. Email me instead.)
Office Hours: Tu 2:45-3:45, Th 11:30-12:30. If you cannot come to my office hours please contact me in class or by email to set up a time to meet.

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 is much more important than that in Math 2414.
Co-requisites: Students must be enrolled in one of the following problem sessions:

<table>
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<tbody>
<tr>
<td>84029</td>
<td>Math 2415.301</td>
<td>F</td>
<td>9:00-10:50</td>
<td>SLC 2.302</td>
</tr>
<tr>
<td>84030</td>
<td>Math 2415.302</td>
<td>F</td>
<td>9:00-10:50</td>
<td>FN 2.106</td>
</tr>
<tr>
<td>85620</td>
<td>Math 2415.303</td>
<td>F</td>
<td>11:00-12:50</td>
<td>CB3 1.312</td>
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<tr>
<td>84213</td>
<td>Math 2415.304</td>
<td>F</td>
<td>11:00-12:50</td>
<td>CB3 1.306</td>
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<tr>
<td>84214</td>
<td>Math 2415.305</td>
<td>F</td>
<td>1:00-2:50</td>
<td>CB3 1.312</td>
</tr>
<tr>
<td>84215</td>
<td>Math 2415.306</td>
<td>F</td>
<td>1:00-2:50</td>
<td>CB3 1.306</td>
</tr>
<tr>
<td>84216</td>
<td>Math 2415.307</td>
<td>F</td>
<td>3:00-4:50</td>
<td>FN 2.106</td>
</tr>
</tbody>
</table>

Students must be enrolled the following exam section (see below for exams dates):

<table>
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<tbody>
<tr>
<td>84028</td>
<td>Math 2415.701</td>
<td>F</td>
<td>7-8:15 pm</td>
<td>SLC 1.102, JO 3.516, CN 1.102, CN 1.120</td>
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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. You must have WebAssign access. Some Options:

2. Loose leaf copy of the text bundled with Enhanced WebAssign access code ISBN: 9781285111605

Calculators: You may use a scientific calculator on exams. However, the exam questions will be designed so that you do not need a calculator. You may not use smart phones or other devices that can be used to access the internet.


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.

Homework

There is a strong correlation between homework grades and performance on exams. There will be required digital homework (DHW), required paper homework (PHW), and recommended homework posted on the course web page for each day of class. See the
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: Active Participation in Problem Sessions 5%, Digital Homework (DHW) 10%, Paper Homework (PHW) 15%, Midterm I 20%, Midterm II 20%, Final 30%.

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. For each problem session you can earn a maximum of 5 points if you arrive within the first 25 minutes and actively participate. You can earn a maximum of 3 points if you are 25 minutes or more late and actively participate.

Homework: Your lowest two digital homework grades and your lowest two paper homework grades will be dropped.

Midterm Exams: There will be two midterm exams, each 75 minutes.

- Midterm 2: , Friday Nov 7th, from 7:00-8:15pm, on 14.5-14.8, 15.1-15.4, 15.7-15.9.

Final Exam: Saturday Dec 13th, from 5:00-7:45pm. The final will be based on the whole course and will be 2 hours 45 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

Attendance at Lectures

A recent informal study by the UTD Department of Mathematical Sciences has shown that there is a very strong correlation between attendance at lectures and course grade. Although
attendance in lectures is not required it is strongly encouraged. You will also be encouraged to actively participate in the lectures in a variety of ways.

**Digital Homework (DHW)**

Unless otherwise advertised in WebAssign and by email, required digital homework (DHW) assigned on TuTh will be due at 8 pm the following Wednesday. Each problem will be worth 5 points. Students will have three attempts, with a maximum score of 5/5 for the first and second attempts and a maximum score of 3/5 for the third attempt. You will be able to submit each part of a multi-part question separately. Therefore, if you get a part correct by second try then you get full credit for that part. Your lowest two digital homework grades will be dropped. You may ask me and the TA’s questions about the digital homework.

**Paper Homework (PHW)**

Unless otherwise stated on the course Schedule and by email required paper homework (PHW) assigned on TuTh will be due at the start of your Problem Session on the Friday of the following week. At least some of the PHW will be graded. You must staple the cover sheet to the front of your paper homework and follow all instructions on the cover sheet. No late homework will be accepted! Your lowest two paper homework grades will be dropped. You may ask me and the TA’s questions about the paper 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.

**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/](http://www.utdallas.edu/deanofstudents/dishonesty/)

**UT Dallas Syllabus Policies and Procedures**

The information at [http://go.utdallas.edu/syllabus-policies](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.

Seven Salient Study Skills

1. Study $\geq 10$ hours per week per course.
2. Start studying 10 days before each exam.
3. Do past exams to master and apply concepts from lectures.
4. Study 70% solo and 30% in a group of 3.
5. Talk more than listen.
6. Write more than read.
7. Understand more than memorize.
8. Ask questions!

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.