

Math 2415, Fall 2019

Calculus of Several Variables

Course Information

Class #	Class Title	Day	Time	Room	Instructor
80303	Math 2415.001	TuTh	1:00pm - 2:15pm	ECSW 3.250	Zweck
80383	Math 2415.002	TuTh	11:30am - 12:45pm	CB3 1.306	Zweck
80575	Math 2415.003	TuTh	1:00pm - 2:15pm	GR 2.530	Li
87215	Math 2415.004	TuTh	4:00pm - 5:15pm	GR 3.420	Dahal
80494	Math 2415.501	TuTh	5:30pm - 6:45pm	GR 3.420	Li

Instructors' Contact Information

Name	Email	Phone	Office	Office Hours
Rabin Dahal	Rabin.Dahal@utdallas.edu	972-883-6584	FO 2.110	TuTh 1:30-3:30 and by appt
Changsong Li	changsong.li@utdallas.edu	972-883-6034	FO 2.108	TuTh 2:30-4:00 and by appt
John Zweck	zweck@utdallas.edu	972-883-6699	FO 3.704J	Tu 2:30-3:30 and by appt

Course Coordinator: John Zweck

WebAssign Contact: Questions about WebAssign should be directed to Dr. Changsong Li.

Webpage: We maintain a web page for the course, linked from Dr. Zweck's web page <https://personal.utdallas.edu/~jwz120030>. *Bookmark it!* All course materials will be posted on this web page. We will also communicate with you using a class email list.

eLearning: eLearning Course **MATH 2415.701** will be used to post grades of assignments and exams and give you access to WebAssign.

Office Hours: If you cannot come make it to office hours *please* contact your instructor in class or by email to set up a time to meet.

TA Info: [Graduate Teaching Assistant and Undergraduate Learning Assitant Contact Info.](#)

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.* See [Brushing Up on Single Variable Calculus](#) at bottom of course web page.

Co-requisites: Students *must* be enrolled in one of the following problem sessions:

Class #	Class Title	Day	Time	Room
80345	Math 2415.301	Friday	8:00am - 9:50am	CB1 1.106
80346	Math 2415.302	Friday	8:00am - 9:50am	FN 2.106
80434	Math 2415.303	Friday	10:00am - 11:50am	FN 2.106
80384	Math 2415.304	Friday	10:00am - 11:50am	PHY 1.202
80385	Math 2415.305	Friday	1:00pm - 2:50pm	CB3 1.308
80386	Math 2415.306	Friday	1:00pm - 2:50pm	FN 2.202
80387	Math 2415.307	Friday	3:00pm - 4:50pm	FN 2.202
80576	Math 2415.308	Friday	3:00pm - 4:50pm	FN 2.106
80621	Math 2415.309	Friday	8:00am - 9:50am	FN 2.202
87216	Math 2415.310	Friday	10:00am - 11:50am	CB1 1.106
87217	Math 2415.311	Friday	1:00pm - 2:50pm	CB3 1.302
87218	Math 2415.312	Friday	3:00pm - 4:50pm	CB3 1.308

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

80344 Math 2415.701 F 7-8:30 pm ECSS 2.410, ECSS 2.412
ECSS 2.415, GR 2.302

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.

PLTL Program

[Peer-Led Team-Learning \(PLTL\) sessions](#) are available for MATH 2415 and are run by the Student Success Center. You can [pre-register for F19 PLTL Lottery!](#) More info on [course web page](#).

Student Learning Outcomes

See separate document [Math 2415 Learning Outcomes](#) on the course web page.

Required Textbooks and Materials

Text: “Calculus (Early Transcendentals)”, Eighth Edition, by James Stewart, Chapters 12-16. (Do *not* purchase the 7th edition!) A less expensive Electronic Version is also available. You must have **WebAssign** access. Some Options:

1. Access code to Enhanced WebAssign (contains digital copy of the text) ISBN: [9781285858265](#)

2. Loose leaf copy of the text bundled with Enhanced WebAssign access code ISBN: [9781305616691](#)
3. Hardbound text bundled with Enhanced WebAssign access code ISBN: [9781305597624](#)

Material Covered: The course will cover the following sections of the textbook: 12.1-12.6, 13.1-13.3, 14.1, 14.3-14.8, 15.1-15.3, 15.6-15.9, 16.1-16.7, and (to the extent that time permits) 16.8-16.9.

Online Resources: We 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](#), [Homework and other Assignments](#) are available on the course web page. In addition, there is a large collection of [Past Exams](#) on the course web page, most with complete solutions.

Homework

There is a strong correlation between homework grades and performance on exams. There will be required **digital homework (DHW)** and required **paper homework (PHW)**, posted on the course web page for each day of class. See the Instructor Policies section below for more information on required homework.

Grading Policy

Grades will be assigned based on the ranges given below using interval notation. The course coordinator in collaboration with the course instructors reserves the right to slightly decrease these ranges. There will be no extra credit. Extensions on homework may be granted in exceptional circumstances. Requests for regrades on homework or the midterm exams must be made no later than 7 days after the work has been returned to the class. There will be no regrades allowed for the final exam. Once posted, the only reason a course grade will be changed is because of a clerical error. Requests for any of the items listed above must be made to the course coordinator by email, accompanied by appropriate documentation.

A ⁺	A	A ⁻	B ⁺	B	B ⁻	C ⁺	C	C ⁻	D	F
[97,100]	[92,97)	[90,92)	[86,90)	[79,86)	[77,79)	[75,77)	[67,75)	[64,67)	[55,64)	[0,55)

Grades: Active Participation in Problem Sessions 5%, Active Learning Projects with 3D Printed Models 5%, Concept Quizzes 5%, Digital Homework (DHW) 10%, Paper Homework (PHW) 15%, Midterm I 15%, Midterm II 20%, Final 25%.

- Participation:** Five percent of your final grade will be assigned by the Teaching Assistant based on the degree to which you *actively* participate in the Friday Problem Sessions. Read the [Handout for Students](#) on how we run the Friday Problem Sessions using the White Boards Method. For each problem session you can earn a maximum of 5 points if you arrive within the first 10 minutes, leave no more than 10 minutes early, and actively participate. You can earn a maximum of 3 points if you arrive more than 10 minutes late, or leave more than 10 minutes early, but still actively participate.
- 3D Models Projects:** Five percent of your final grade will be assigned by the Teaching Assistants based on the degree to which you correctly complete **three** of the [Active Learning Projects with 3D Printed Models](#) which will be done in the Friday Problem Sessions on Sep 20, Oct 11, and Oct 25.
- Concept Quizzes:** Prior to the start of each week, several theory questions *drawn directly from the lecture material* will be posted on the [course schedule webpage](#) . **At the start** of your Friday Problem Session, there will be a short (5 minute) closed book quiz in which you will provide answers to **three** of these questions. The purpose of these weekly, low-stakes quizzes is to make sure you have memorized and at least partially understood the concepts discussed in class before applying them yourselves to solve problems. The quizzes will help you understand how and what to learn and how to know when you have learned. For example, we may ask you to state the formula for the dot product, draw a picture illustrating the concept of a vector projection, or state the chain rule for functions of two variables. *The quizzes will not include any problem solving.* **Your lowest two quiz scores will be dropped. There will be no make ups for the quizzes.**
- Homework:** Your lowest two paper homework scores will be dropped.
- Midterm Exams:** There will be two midterm exams, each 75 minutes.
- Midterm I: Friday Sep 27th, from 7:00-8:15pm, on 12.1-12.6, 13.1-13.3 (excluding curvature), 15.7 (cylindrical coordinates only), 15.8 (spherical coordinates only).
 - Midterm II: Friday Nov 1st, from 7:00-8:15pm, on 14.1, 14.3-14.8, 15.1-15.2, 16.6 (excluding surface area).
- Final Exam:** Sat. Dec 7, 5-7:45pm. Rooms TBA. The final will be based on the whole course and will be 2 hours 45 mins.

Instructor Policies

Attendance

Attendance in Lectures and Problem Sections is mandatory and will be recorded. An 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.

Policy on Electronic Devices in Lectures

Electronic devices, such as cell phones, should be turned off during lectures.

Digital Homework (DHW)

Unless otherwise advertised in WebAssign or by email, **required digital homework (DHW)** assigned on TuTh will be due at **11:59pm 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 the second attempt then you get full credit for that part. You may ask your instructor and the graduate 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**. Each week about 5 of the assigned problems 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 your instructor and the graduate 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*. We do not encourage large groups of people to work together on homework.

Policy on Calculators in Exams

No calculators, mobile devices, or other electronic devices are allowed in exams. The exam questions will be designed so that you do not need a calculator.

Making up an exam you missed

If you know ahead of time that you will be missing an exam, you must contact the course coordinator and your instructor by email at least 4 days in advance of the scheduled exam. If an emergency arises which prevents you from taking the exam at the scheduled time you must contact the course coordinator and your instructor by email **no later than 48 hours after** the exam time. Generally speaking, in the event of a personal emergency 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 we will listen to all reasonable requests. Be prepared to bring appropriate evidence in support of your request.

Academic Integrity

We will be vigorous in reporting all instances of cheating to the University administration. (See <http://www.utdallas.edu/deanofstudents/dishonesty/>) In particular, you may **not** use solutions manuals, solutions you find online, or solutions copied verbatim from other students for the digital or paper homework. The graders are trained to detect such instances of cheating and will report them to the course coordinator. Your instructor reserves the right to recommend to the University administration penalties varying from receiving zero points for a particular homework, to zero for your entire homework grade for the course, to failing the course. Analogous statements apply to the exams.

Seven Salient Study Skills

1. Study ≥ 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!

Also see [Chew Videos on How to Study](#)

Advice for Exams

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

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. There may be a question or two that involves a *written explanation* of the *theory* we discuss in class.

We 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 with your lecture notes and book closed write down what you know about each item in the [Math 2415 Learning Outcomes](#) on the course webpage, 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 (past exam) 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.

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.