

Course Syllabus

Fall 2009

Calculus of Several Variables

Aug 18, 2009

10433 Math 2415.001 TR 10:00 - 11:15 pm GR 3.302

Instructor Contact Information

Instructor: Dr. David L. Lewis
Office: ECSN 3.202
Phone: 972-883-6037
E-mail: dlewis
Mail: Mail Stop EC 35
Office hours: 11:30 - 12:30 pm TR or by appointment

If a personal situation arises that you feel I need to be aware of, send that information to;
dlewis@utdallas.edu.

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Prerequisites: A grade of C- or better in MATH 2414 or equivalent.

Co-requisites: Students ***MUST*** be enrolled in one of the following problem sections.

10390	2015.301	T	11:30 am – 1:20 pm	FN 2.202
10391	2015.303	R	2:30 – 4:20 pm	SOM 2.904

During problem section, the TA shall:

- review class material and relevant material from prerequisite courses
- return and discuss quizzes and exams
- work problems, or have students work problems
- entertain questions
- administer quizzes

Course Description

Continuation of the MATH 2413, 2414 calculus 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, change of variables in double and triple integrals.

Student Learning Objectives/Outcomes

- (1) Students will be able to formulate real world problems into mathematical statements.
 - Given a narrative description of a problem that lends itself to mathematical analysis, the student will clearly define any variable quantities introduced and provide an appropriate equation, function, or formula relating those variables.
- (2) Students will be able to develop solutions to mathematical problems at the level appropriate to the course.

- Students will be able to describe plane and space curves via vector valued functions and describe their physical attributes using calculus and vector operations.
 - Given a scalar function of several variables, students will compute a partial derivative of specified order and, if instructed, evaluate the partial derivative at a point in its domain.
 - Students will compute a multiple integral.
- (3) Students will be able to describe or demonstrate mathematical solutions either numerically or graphically.
- Students shall provide a qualitative, planar sketch which clearly indicates prescribed attributes.
 - Students shall provide numerical results to a specified accuracy, or as a percent.

Required Textbook

Text: *Calculus, Early Transcendentals* 6th Edition, Stewart

Suggested Course Materials

Solutions manual: The Student Solutions Manual is recommended and available in the bookstore.

Calculators: A scientific calculator is recommended. Graphing calculators, programmable calculators, calculators with non-numeric displays, or calculators with symbolic differentiation/integration capabilities are NOT ALLOWED on quizzes or exams.

Additional Resources

WebCT: <http://webct.utdallas.edu> requires your NETID and password to logon. Once logged in, select this course. If successful, you will see a link to the syllabus and a blue backpack which contains additional course material. You can view your grades, use the email tool, or utilize the discussion tool to communicate with your classmates. You will receive a notice via WebCT6 (either an announcement, or an email) if there is additional information, exam date/location change, etc, or an urgent message, class canceled, etc, that directly impacts this course. If a personal situation arises that you feel I need to be aware of, send that information to; dlewis@utdallas.edu. I would prefer you do not send email to me via WebCT.

The UTD Math Lab is located in Room CN 1.126 (phone: 972-883-6707) The hours are posted on the door. The Math Lab provides free walk-in tutoring for students. In addition to the help available during normal operating hours, each registered student is entitled to a free, one-hour, individual tutorial per week. Individual tutorials require an appointment which are arranged via learning center personnel.

Academic Calendar

8/27	Last day to add a course
9/4	Census day, Last day to drop without record.
9/8 - 9/16	Students may withdraw from a class with signature and receive a W.
9/17 - 10/22	WP WF period, with signatures of instructor <u>and</u> advisor.
10/23 -	Students may withdraw from a class for non-academic reasons only.

Course Schedule (subject to change)

Week	Tue		Thur		Scores
1			8/20	Introduction, Syllabus, Sec: 10.1	
2	8/25	Sec: 10.1/10.2	8/27	Sec: 10.3, 10.4	
3	9/1	Sec: 12.3/12.4	9/3	Sec: 12.4/12/5	Qz 1
4	9/8	Sec: 12.6/13.1	9/10	Sec: 13.1/13.2	Qz 2
5	9/15	Sec: 13.3/13.4	9/17	Sec: 13.4/14.1	Qz 3
6	9/22	Exam 1	9/24	Sec: 14.2	
7	9/29	Sec: 14.3	10/1	Sec: 14.4/14.5	Qz 4
8	10/6	Sec: 14.5/14.6	10/8	Sec: 14.6	Qz 5
9	10/13	Sec: 14.7	10/15	Sec: 14.8 / 15.1	Qz 6
10	10/20	Sec: 15.1/15.2	10/22	Sec: 15.3	Qz 7
11	10/27	Sec: 15.4	10/29	Sec: 15.4/15.5	Qz 8
12	11/3	Exam 2	11/5	Sec: 15.6	
13	11/10	Sec: 15.7/15.8	11/12	Sec: 15.8	Qz 9
14	11/17	Sec: 15.9	11/19	Sec: 16.1	Qz 10
15	11/24	Sec: 16.2	11/26	Thanksgiving Day	
16	12/1	Sec: 16.3	12/3	Last class meeting Sec: 16.4	
17	12/8	No Class Reading Day	12/10	Final Exam 8 – 10:45 am Room TBA	

Final Exam: Thursday Dec 10, 8:00 - 10:45 am

Assignments

Homework exercises generally consist of odd-numbered problems that have solutions in the back of the text. The assignments are intended to supply adequate practice for mastery of the concepts presented in each section. You should challenge yourself by attempting some of the even-numbered problems of like kind and checking your solutions where possible. Homework will not be collected.

6th ed	Stewart, Early transcendentals Sep 8, 2008
10.1 Para curves	1,5b,7b,9b,11,13,15,16,19,21,28a,31,33,37,45a,b,46a
10.2 Calc of para	1,3,5,7,9 line only,11,13,17,19,25,27a,29,31,37set up,41,43,45,47,53,59,61,65
10.3 Polar	1-43 odds,57,59,63,65,67,(71 - 76 use a polar plotter if interested)
10.4 Area and Length	1,3,5,7,9,13,17,21,23,25,27,29,33,35,37,39,45,47,53
Sec 12.1* 3D	1,3,4,5,6,7,10,11,13,15,17,19,21,23,25,27,29,31,34,35,36,39
Sec 12.2* Vector	1,2,3,5,7,9,11,13,15,17,19,20,21,23,25,27,35,37,41,43,45
Sec 12.3 Dot Prod	1,3,5,7,9,11,13,15,17,19,21,23,25,29,35,36,37,38,39,41,19,51,55,58
Sec 12.4 Cross Prod	1,3,5,6,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,43,45
Sec 12.5 Lines & Planes	1a,c,e,g,i,k,3,5,7,11-43 odds,47,49,51,59,63,65,67,69,71
Sec 12.6* Surfaces	1,3,5,7,11,17,19,21,23,25,27,33,41,47
Sec 13.1 VVF	1,3,4,5,9,11,15,17,19,21,23,24,25,27,35,41,43abc
Sec 13.2 Dt VVF	1,3,5,9,11,13,15,17,19,21,23,26,31,33,34,35,37,41,42,45,47,49
Sec 13.3 Arc&Curvature	1,2,3,5,11,13,15,17,19,21,23,25,31,33,40,41,43,45,53
Sec 13.4 Motion	1,3,5,7,8,9,11,13,15,17a,23,25,29,33,35,37,41
Sec 14.1 f(xy)	1,3,5,9,11,13,15,17,21,23,25,27,29,31,33,35,39,41,4955,57,59,61,62,63,64,65
Sec 14.2 Limit/ cont	1,5,7,9,11,13,19,21,25,29,31,33,35,39,41, read 45
Sec 14.3 Partial	1,5,7,10,11,15,17,19,21,23,25,26,27,29,31,39,40,41,45,49,51,55,57,61,64,65,71,72,73,77,81,83,85,89,
Sec 14.4 Tangent plane	1,3,4,5,11,13,15,17,19,21,25,27,28,29,31,33,35,39,41
Sec 14.5 Chain Rule	1,3,5,6,7,9,11,13,17,19,21,23,25,27,29,31,33,35,39,40,41,43,45,49,51,55,
Sec 14.6 Duf	1,5,7,9,11,13,15,17,21,23,25,27,31,35,38,39,41,43,47,53,59,61
Sec 14.7 Optimization	1,5,7,9,13,15,17,19,29,31,35,39,43,47,51,55
Sec 14.8 LaGrange	1,3,5,9,11,18,19,23,27,31,35,41
Sec 15.1 Dbl Int	1,3,7,9,11,13,17
Sec 15.2 Iterated Int	1,3,5,7,9,11,13,15,17,18,19,21,23,25,27,29,31,35
Sec 15.3 Dbl over D	1,3,5,7,9,11,13,15,17,21,25,27,33,39,41,43,45,47,49,51,55,61
Sec 15.4 Dbl Polar	1,3,5,7,9,11,13,15,17,19,23,25,27,29,31,35,36a(polar?)b,c,d
Sec 15.5 Apps	1,3,5,7,9,11,13,17
Sec 15.6 Trip Int	1,3,5,7,9,13,15,17,21,23,27,29,31,33,35,43,45,51
Sec 15.7 Trip Polar	5,6,7,8,9,11,13,15,17,19,21,23a,stup ,27,29
Sec 15.8 Trip Sphere	1,3,5,6,7,8,9,11,12,13,15,17,19,20,21,23,25,27,29,31,32,35,37,39
Sec 15.9 Chng variables	1,3,5,7,9,11,13,15,17,19,21
Sec 16.1 Vector Fields	(Sketch or describe the vec fields 1,3,5,7,9),11,13,15,17,21,23,25,29,33,35a
Sec 16.2 Line Int	1,3,5,7,9,11,13,15,17,19,21,29,33,35,37,39,41,45
Sec 16.3 FT Line Int	1,3,5,7,9,11,13,15,17,19,21,27,29,31,33,
Sec 16.4 Greens	1,3,5,7,9,11,13,17,19,21,22,23,25

Grade Policy

Grade: The course grade is determined from the following:

Two major exams:

10 Quizzes:

Comprehensive Final Exam:

Weights:	20%	Quiz %, best 8 quiz scores scaled to 100%.
	50%	Major exams (25% each)
	30%	Final Exam, comprehensive, not optional. (the final exam score, if higher, will replace the lower score of the two major exams.)

Grade Scale	[96.6,100]...A+	[93.3,96.6)....A	[90,93.3)....A-
	[86.6,90)....B+	[83.3,86.6)....B	[80,83.3)....B-
	[76.6,80)....C+	[73.3,76.6)....C	[70,73.3)....C-
	[66.6,70)....D+	[63.3,66.6)....D	[60,63.3)....D-
	[0,60)....F		

Example: Ex 1 = 83, Ex 2 = 74, Quiz% = 70, Final Exam = 87.
Course percent = $0.2(70)+0.25(83+87)+0.3(87)=82.6$, Course grade B-

Each quiz will be administered during the problem section and will be returned to you at the next meeting of your problem section. Each major exam will occur during regular lecture time but possibly in a different classroom. You will be notified in class of any change of venue prior to the date of the exam. Your graded exams will be made available to you during the next problem section.

Course & Instructor Policies

*Attendance: Daily attendance may be taken, if so, it will be incorporated into the course grade calculation as a non-optional 11th quiz score worth 22 points.

Citizenship: Any action that disturbs your classmates or interrupts the lecture is unacceptable. Examples of such actions are:

- Entering the classroom late - be as punctual as possible.
- Leaving the classroom before break or before the end of lecture.
- Cell phones, ringers, buzzers, beepers, alarms, raspberries, blackberries - turn them off! unless you are a member of an emergency response team.

An apology is expected from anyone creating such a disturbance.

Student participation in class is desired, however, please raise your hand to speak and avoid having side conversations with your classmates.

There will be **no extra credit**

Exams/quizzes:

- There will be no make-up quizzes.
 - There will be no make-up exams unless the circumstances are extraordinary.
 - Exams and quizzes are closed book, without notes, and without graphing calculators.
 - SHOW ALL WORK on quizzes and exams. Unsupported answers are considered miracles and, while inspirational, will receive little or no credit. Graded quizzes and major exams will be returned to you as soon as possible. Any document not picked up by the end of finals week will be destroyed.
 - Final exams are not returned to the student but are held for review for one year
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Technical Support

If you experience any problems with your UTD account you may send an email to: assist@utdallas.edu or call the UTD Computer Helpdesk at 972-883-2911.

Intercollegiate Competitions

Students involved in a UTD sanctioned competitive activity must supply the instructor with a letter certifying his/her eligibility to participate in such a competition. Said letter may be obtained from the Intercollegiate Compliance Officer. It is the students' responsibility to discern scheduling conflicts and to inform the instructor well in advance of a class, quiz, or exam that will be missed due to a competition. The instructor will make reasonable accommodation to resolve the conflict.

Field Trip Policies

Off-campus Instruction and Course Activities

Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at the website address http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm. Additional information is available from the office of the school dean. Below is a description of any travel and/or risk-related activity associated with this course.

General University policies on Academic Integrity, Incomplete Grades, and other important topics, form part of this Syllabus, and are to be found in the version of the Syllabus posted on the Web.

Student Conduct & Discipline

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, *A to Z Guide*, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the *Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3*, and in Title V, Rules on Student Services and Activities of the university's *Handbook of Operating Procedures*. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

Academic Integrity

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.

Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Email Use

The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

Copyright Notice

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials, including music and software. Copying, displaying, reproducing, or distributing copyrighted works may infringe the copyright owner's rights and such infringement is subject to appropriate disciplinary action as well as criminal penalties provided by federal law. Usage of such material is only appropriate when that usage constitutes "fair use" under the Copyright Act. As a UT Dallas student, you are required to follow the institution's copyright policy (Policy Memorandum 84-I.3-46). For more information about the fair use exemption, see <http://www.utsystem.edu/ogc/intellectualproperty/copypol2.htm>

Withdrawal from Class

The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.

Student Grievance Procedures

Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's *Handbook of Operating Procedures*.

In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.

Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.

Incomplete Grade Policy

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of **F**.

Disability Services

The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.

The contact information for the Office of Disability Services is:

The University of Texas at Dallas, SU 22
PO Box 830688
Richardson, Texas 75083-0688
(972) 883-2098 (voice or TTY)

Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance.

It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.

Religious Holy Days

The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.

The student is encouraged to notify the instructor or activity sponsor as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.

If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.

These descriptions and timelines are subject to change at the discretion of the Professor.