MATH 2415 – CALCULUS OF SEVERAL VARIABLES
Summer 2020

Lecture Information:

Lecture	Meeting Time	Instructor	Email
MATH 2415.0U1	MW 12:30 – 2:45pm	Dr. Changsong Li	Changsong@utdallas.edu
MATH 2415.0U2	MW 12:30 – 2:45pm	Dr. Mohammad Akbar	akbar@utdallas.edu

Problem Session Information:

Problem Section	Meeting Time	Instructor	Email
MATH 2415.8U1	M 5:30 – 7:45pm	Mehdi Akhavan	mxa154630@utdallas.edu
MATH 2415.8U2	M 5:30 – 7:45pm	Bradley Meyer	Bradley.Meyer@utdallas.edu
MATH 2415.8U3	M 5:30 – 7:45pm	Jonathan Popa	jonathan.popa1@utdallas.edu

Course Description:

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 (4 semester credit hours).

Pre-Requisite:

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

Co-requisite:

Students must enroll in one of the problem sessions MATH 2415.8U1, 8U2 or 8U3 in addition to the lecture section MATH 2415.0U1 or 0U2.

Textbook and Materials:

- **Textbook:** Calculus: Early Transcendentals, 8^{th} *edition*, James Stewart, Chapters 12-16.
- **WebAssign:** You must have **WebAssign** access. Some Options:
  1. Single-term WebAssign printed access card(contains ebook): ISBN: 9781337771467
  2. Multi-term WebAssign printed access card(contains ebook): ISBN: 9781337771474
  3. Bundle: Loose-leaf textbook+multi-term WebAssign access: ISBN: 9781305616691

4. Bundle: Hardcover textbook+multi-term WebAssign access: ISBN: 9781305597624

- **Sections 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, and 16.1-16.9.

Tentative Lecture Schedule:

Week	Date	Lecture	DHW Due	GHW & Quiz Due
1	5/27 (WED)	12.1, 12.2		
	5/31 (SUN)		DHW01	
2	6/01 (MON)	12.3, 12.4		
	6/03 (WED)	12.5, 12.6		GHW01, Quiz01
	6/07 (SUN)		DHW02	
3	6/08 (MON)	12.6, 13.1		
	6/10 (WED)	13.2, 13.3		GHW02, Quiz02
	6/14 (SUN)		DHW03	
4	6/15 (MON)	14.1, 14.3		
	6/17 (WED)	Exam I		GHW03
	6/21 (SUN)		DHW04	
5	6/22 (MON)	14.4, 14.5		
	6/24 (WED)	14.5, 14.6		GHW04, Quiz04
	6/28 (SUN)		DHW05	
6	6/29 (MON)	14.7, 14.8		
	7/01 (WED)	14.8, 15.1		GHW05, Quiz05
	7/05 (SUN)		DHW06	
7	7/06 (MON)	15.2, 15.3		
	7/08 (WED)	15.3, 15.6		GHW06, Quiz06
	7/12 (SUN)		DHW07	
8	7/13 (MON)	15.7, 15.8		
	7/15 (WED)	Exam II		GHW07
	7/19 (SUN)		DHW08	
9	7/20 (MON)	15.8, 15.9		
	7/22 (WED)	16.1, 16.2		GHW08, Quiz08
	7/26 (SUN)		DHW09	
10	7/27 (MON)	16.3, 16.4		
	7/29 (WED)	16.5, 16.6		GHW09, Quiz09
	8/02 (SUN)		DHW10	
11	8/03 (MON)	16.7, 16.8, 16.9		
	8/05 (WED)			GHW10, Quiz10

eLearning:

You must check MATH 2415.0U1/0U2 page, and MATH 2415.8U1/8U2/8U3 page of eLearning regularly:

`https://eLearning.utdallas.edu`

- **MATH 2415.0U1/0U2**
  - Lectures will be delivered at the regular lecture time. Go to eLearning – MATH 2415.0U1/0U2 – Blackboard Collaborate (left-hand side).
- **MATH 2415.8U1/8U2/8U3**
  - Problem sessions will be conducted at the regular problem session time. Go to eLearning – MATH 2415.8U1/8U2/8U3 – Blackboard Collaborate (left-hand side).
  - Paper Homework (GHW), grades, and important announcements will be posted.
  - Access to WebAssign.
  - Exams will be conducted.

Students Learning Outcomes

1. Students will be able to calculate the dot, cross, and triple product of vectors and apply those products to calculate the angle between two vectors, area of triangle and parallelogram, and volume of a parallelopiped. Students will also be able to find vector and scalar projection of a vector in the direction of another vector.
2. Given an algebraic or parametric or vector equation, the students will be able to determine the graph in space as a line or a plane or a quadric surface, or a space curve and graph it.
3. Students will be able to graph, find the limit at a point, calculate partial derivatives, and find the extreme values (both relative and absolute) of a given function of two variables.
4. Students will be able to solve the constrained optimization problems using Lagrange multiplier.
5. Students will be able to compute double integrals in cartesian coordinates over rectangular regions and general regions of type I and type II. Students will also be able to compute double integrals in polar coordinates and simple triple integrals in cylindrical and spherical coordinates.
6. Students will be able to compute and interpret directional derivatives, gradient of a scalar function, and curl and divergence of a vector field at a given point.
7. Students will be able to compute the line integrals of a vector field along a closed curve using Green's Theorem.
8. Students will be able to calculate the line integral of a vector field using Stokes' Theorem and to calculate the surface integral of a vector field using the Divergence Theorem.

Course Policy & Grading Scheme

1. **Digital Homework (DHW):**
   - Digital Homework (DHW) will be made available in WebAssign, and will be due by **Sunday 11:59 pm of the same week**.
   - The lowest DHW score will be dropped.
   - DHW will count as 20% towards your final grade.

2. **Graded Homework (GHW):**

   - Graded Homework (GHW) will be posted on eLearning as pdf files. You may either work on the pdf file directly using your computer/laptop, or print the file out – either case write your solutions in the space provided. If neither of these two options is available to you, write your solutions on papers (one question per page). Submit your work as a single pdf file (you can scan either by a scanner or by your smart phone – it is your responsibility that they are legible). The due date for GHW is every **Wednesday before lecture time (12:30 pm)**.
   - You must show all of your work to earn full credit. Correct answers without sufficient supporting work will receive zero or reduced credit.
   - Collaboration is encouraged. However, the final write up should be yours – two identical GHW will both get zero and be reported to the university academic dishonesty department.
   - Only a subset of assigned problems will be graded but you will not be told in advance which ones.
   - The lowest GHW score will be dropped.
   - GHW will count as 15% towards your final grade.

3. **Quizzes:**

   - Starting from the second week, weekly quizzes will be administered every Wednesday on-line through WebAssign and/or eLearning. It will cover the same material covered in the preceding DHW and GHW, *i.e.*, the previous week's lecture material. The idea that both homeworks as well as the TA session on Monday are made to precede the quiz means that you will be sufficiently prepared. In general, you will be given 20 minutes to complete the quiz.
   - There will be no quiz during an exam week.
   - The lowest quiz score will be dropped.
   - Quizzes will count as 15% towards your final grade.

4. **Exams:**

   - Exam I will count as 15% towards your final grade.
   - Exam II will count as 15% towards your final grade.
   - Final Exam is comprehensive but more emphasis on the material covered after Exam II. It will count as 20% towards your final grade.

5. **Grading Scheme:** All letter grades will be assigned in accordance with the table of numeric to alphabetic conversions given below.

   [90; 94) A-, [94; 97) A, [97; 100^{+}] A+
   [80; 84) B-, [84; 87) B, [87; 90) B+
   [70; 74) C-, [74; 77) C, [77; 80) C+
   [60; 64) D-, [64; 67) D, [67; 70) D+
   [0, 60) F.

Makeup Policy:

- There is no make-up for any late or missed assignments or exams, unless extreme circumstances with proper documentation accepted by the instructor.
- In cases of extreme circumstances, one is expected to report to the instructor **before** the deadline of the coursework and resolve the problem within **one** week after the deadline.

UT Dallas Syllabus Policies and Procedures:

The information at

`http://go.utdallas.edu/syllabus-policies`

constitutes university's syllabus policies and procedures segment of this syllabus.

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

ADDENDUM

WebAssign Instructions:

To gain access to WebAssign:

1. Log into eLearning, and select the course

   MATH 2415.8U1/8U2/8U3 - Calculus of Several Variables - Su20

2. Click the link on the eLearning course homepage entitled **"WebAssign"**.

3. If you already have a WebAssign account, you will either see the WebAssign course **MATH 2415-Calculus of Several Variables - Su20** at the left or you will see a pull-down menu with courses listed; choose

   MATH 2415 - Calculus of Several Variables - Su20

4. (a) If you already have a WebAssign account with the text for this course, you should be taken to the WebAssign course

   MATH 2415 - Calculus of Several Variables - Su20

   (b) If you do not already have a WebAssign account with the text for this course, you will have 3 options to register.

   - Purchase access online if you do not already have an access code and you want to buy access to the ebook and homework problems without printed text.
   - Enter an access code if you have already purchased it.
   - Continue my **trial period** if you want to start using the system before purchasing. The deadline is given in red.

Once you have registered, you should be taken to the WebAssign course

MATH 2415 - Calculus of Several Variables - Su20

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