MATH 2415 CALCULUS OF SEVERAL VARIABLES
Syllabus-Spring 2020

Class Information:

Class Section	Location	Days	Time	Instructor
MATH 2415.001	GR 3.420	Tue, Thu	8:30-9:45am	Baris Coskunuzer
MATH 2415.002	CB3 1.306	Tue, Thu	10:00am-11:15am	Baris Coskunuzer
MATH 2415.003	GR 3.420	Tue, Thu	11:30am-12:45pm	Rabin Dahal
MATH 2415.004	JO 3.516	Tue, Thu	2:30pm-3:45pm	Rabin Dahal

Instructor Information:

Instructor : Baris Coskunuzer	Instructor: Rabin Dahal
Office: FA 2.410	Office: FO 2.410B
Office Hrs: Tue 11:30-1:30pm, Thu 1-3pm and by appt	Office Hrs: Tue 10-11am, Thu 10-11am, 5:30-6:30pm and by appt.
Email: `Coskunuz@utdallas.edu`	Email: `Rabin.Dahal@utdallas.edu`
Phone: (972) 883 4636	Phone: (972) 883 6584

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, the line integral, Green's theorem, Stokes' theorem, divergence theorem.(3 lecture hours and 2 problem section hours per week; 4 semester credit hours).

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

Co-requisites: Students must enroll in one of the problem section MATH 2415.30x in addition to a lecture section MATH 2415.00x. Problem sections meet on each Friday. Students are automatically enrolled in MATH 2415.701 exam section which meets in exam days only.

Textbook: We use **Calculus**, *Early Transcendentals*, 8th *edition* by James Stewart. We 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 16.8-16.9.

WebAssign: You MUST have **WebAssign** access as the weekly digital homework(DHW) will be assigned on WebAssign. WebAssign also contains electronic version of the textbook. You should purchase an access code for this text to create an account or to add this course in your existing account. Here are some options for purchasing the access code:

1. Multi-term WebAssign printed access card(contains ebook): ISBN: 9781337771504

2. Bundle: Loose-leaf textbook+multi-term WebAssign access: ISBN: 9781305710306

3. Bundle: Hardcover textbook+multi-term WebAssign access: ISBN: 9781305709379

4. Cengage Unlimited: ISBN: 9780357700006 (4-month access), ISBN: 9780357700013 (12-month access), ISBN: 9780357700020 (24-month access).

eLearning: You must regularly check the MATH 2415.701 (the exam section) page of eLearning:

https://elearning.utdallas.edu

Paper Homework(PHW), grades, and important announcements will be posted under the course MATH 2415.701 on eLearning. You will also access WebAssign for Digital Homework(DHW) through the course MATH 2415.701 on eLearning.

PLTL Program: Peer-Led Team-Learning (PLTL) sessions are available for MATH 2415. More details will be posted on eLearning in about the second week of the semester.

http://www.utdallas.edu/studentsuccess/help-with-courses/peer-led-team-learning/

Mathlab: The Student Success Center Math Lab offers free help in math, physics and statistics courses to UT Dallas students currently enrolled in classes. Please contact Math Lab for appointment and info. Website:

http://www.utdallas.edu/studentsuccess/mathlab/

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 parallelepiped. Students will also be able to find vector and scalar projection of a vector into 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, calculate partial derivatives, and find the relative/absolute extrema (if any) of a given function of two variables.

4. Students will be able to solve the constrained optimization problems using the Lagrange multiplier.

5. Students will be able to find the gradient and the directional derivative of scalar functions of 2 and 3 variables. Students will also be able to find the maximum and minimum rate of change in the scalar function and the corresponding directions.

6. 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.

7. Students will be able to calculate the area of a fence and work done by a force as line integrals of a scalar function and force vector field over a piece-wise smooth curve.

8. Students will be able to calculate and interpret the curl and divergence of a vector function.

9. Students will be able to calculate the line integrals of a vector field along a closed curve using Green's theorem.

Course Policy & Grading Scheme

1. **Digital Homework(DHW):**

   - Weekly Digital Homework(DHW) will be made available in WebAssign every Tuesday and will be due at 11:59pm Wednesday in the following week.
   - 2 lowest DHW scores will be dropped at the end of the semester.
   - DHW is worth 10% toward the final grade.

2. **Paper Homework(PHW):**

   - A pdf file of weekly Paper Homework(PHW) will be posted each week on eLearning.
   - You must print the pdf of the PHW, write your solutions in the space provided, staple it, and turn in at the beginning of the problem section.
   - You must show all of your work to earn full credit. Correct answers without sufficient supporting work will receive no or reduced credit.
   - You may ask questions about PHW to your instructor or TA or your class mate. Collaboration is encouraged. However the final write up should be yours-two identical PHW will both get zero.
   - Only a subset of assigned problems on PHW will be graded but you will not be told in advance which ones.
   - PHW will count as 15% toward your final grade.
   - 2 lowest PHWs will be dropped at the end of the semester.

3. **Mid-Term Exams:**

   - Exam I: Feb. 21, Friday 7:00pm-8:15pm; Location: TBA
   - Exam II: April 03, Friday 7:00pm-8:15pm; Location: TBA
   - Each midterm exam counts 20% toward the final grade.

4. **Final Exam**

   - TBA
   - Location: TBA
   - Comprehensive but more emphasis will be on the material covered after Exam II.
   - Final exam will count as 25% towards your final grade.

   Note: Exam locations will be assigned and posted tentatively one week before each exam.

5. **Active Learning :** 5% of your grade will be given by the Teaching Assistants based on your active participation in Active Learning during the Friday Problem Sections. The whole class will be divided into 8-10 groups (3-4 students in a group), and all groups will simultaneously work on assigned problems on the white board. The Teaching Assistant (TA) and Undergraduate Learning Assistant (ULA) will keep walking around the class room monitoring groups' progress and may give you some idea, and answer your questions.

For each session you will receive 5 points if you arrive on time, and actively participate in the entire session. You will earn at most 4.5 points if you arrive in the first 10 minutes, leave no more than 20 minutes early and actively participate. You will earn 0-4 points depending on how late you arrive, how early you leave and how actively you participate. Two lowest participation grades will be dropped.

6. **Concept Quiz:**

   - A concept quiz will be given each week (except for the exam week) at the beginning of the problem section.
   - Each concept quiz will consists of 2-3 conceptual questions. Usually, definitions, formulas etc. You must write the formal answer to the quiz questions using appropriate mathematical notations and symbols to receive full credit.
   - A list of conceptual questions will be posted on eLearning each week and the questions on the concept quiz will be chosen from this list.
   - Concept quiz will count as 5% towards the final grade.
   - You will have only 5 minutes to complete the concept quiz.
   - Two lowest concept quizzes will be dropped at the end of the semester.

Late/Missed Coursework: There is no make-up for late or missed assignments, quizzes, or exams, unless extreme circumstances with proper documentation accepted by the instructor.

Calculators: Calculators are not allowed in the exams and quizzes. The exams will involve simple calculations so that you will not need a calculator.

Grading Scheme:

- – Two midterm exams: 40%(20% each)
  – Digital Homework: 10%
  – Paper Homework: 15%
  – Active Learning: 5%
  – Concept Quiz: 5%
  – Final exam: 25%

- All letter grades will be assigned in accordance with the table of numeric to alphabetic conversions given below.

$$[90; 93)= \text{A-}, \quad [93; 97)= \text{A}, \quad [97; 100^+]= \text{A+}$$
$$[80; 83)= \text{B-}, \quad [83; 87) = \text{B}, \quad [87; 90)= \text{B+}$$
$$[70; 73)= \text{C-}, \quad [73; 77)= \text{C}, \quad [77; 80)= \text{C+}$$
$$[60; 63)= \text{D-}, \quad [63; 67)= \text{D}, \quad [67; 70)= \text{D+}$$
$$[0, 60)= \text{F}.$$

Tentative Schedule

Tuesday	Wednesday	Thursday	Friday
Jan 14th **1** Sec 12.1, 12.2	15th **2**	16th **3** Sec 12.3	17th **4** CQ-1; 12.1,12.2,12.3
21st **5** Sec 12.4	22nd **6** DHW-1 Due	23rd **7** Sec 12.5	24th **8** PHW-1 Due, CQ-2; 12.4, 12.5
28th **9** Sec 12.6	29th **10** DHW-2 Due	30th **11** Sec 13.1	31st **12** PHW-2 Due, CQ-3; 12.6,13.1
Feb 4th **13** Sec 13.2, 13.3	5th **14** DHW-3 Due	6th **15** Sec 14.1	7th **16** PHW-3 Due, CQ-4; 13.2, 13.3, 14.1
11th **17** Sec 14.3	12th **18** DHW-4 Due	13th **19** Sec 14.4	14th **20** PHW-4 Due, CQ-5, 14.3, 14.4
18th **21** Sec 14.5	19th **22** DHW-5 Due	20th **23** Sec 14.6	21st **24** Review, Exam#1
25th **25** Sec 14.7	26th **26** DHW-6 Due	27th **27** Sec 14.7	28th **28** PHW-5 Due, CQ-6, 14.7
Mar 3rd **29** Sec 14.8	4th **30** DHW-7 Due	5th **31** Sec 15.1	6th **32** PHW-6 Due, CQ-7, 14.8, 15.1
10th **33** Sec 15.2	11th **34** DHW-8 Due	12th **35** Sec 15.3	13th **36** PHW-7 Due, CQ-8, 15.2, 15.3
17th **37** Spring Break	18th **38** Spring Break	19th **39** Spring Break	20th **40** Spring Break
24th **41** Sec 15.6	25th **42** DHW-9 Due	26th **43** Sec 15.7	27th **44** PHW-8 Due, CQ-9, 15.6, 15.7

Tuesday	Wednesday	Thursday	Friday
31st **45** Sec 15.8	Apr 1st **46** DHW-10 Due	2nd **47** Sec 15.9	3rd **48** Review, Exam II
7th **49** Sec 16.1	8th **50** DHW-11 Due	9th **51** Sec 16.2	10th **52** PHW-9 Due, CQ-10, 16.1, 16.2
14th **53** Sec 16.3	15th **54** DHW-12 Due	16th **55** Sec 16.4	17th **56** PHW-10 Due, CQ-11, 16.3, 16.4
21st **57** Sec 16.5	22nd **58** DHW-13 Due	23rd **59** Sec 16.6	24th **60** PHW-11 Due, CQ-12, 16.5, 16.6
28th **61** Sec 16.7	29th **62** DHW-14 Due	30th **63** Sec 16.8, 16.9	May 1st **64** PHW-12 Due
5th **65**	6th **66**	7th **67**	8th **68**

Important Dates

- Monday, January 13, 2020: Classes begin
- Monday, January 20, 2020: Martin Luthar King Day- No class.
- Wednesday, January 29, 2020: Last Day to Drop a class without a "W" Full Term Session
- **Midterm Exam I**: Friday 7:00pm-8:15pm, Feb. 21, 2020. Location TBA
- **Midterm Exam II**: Friday 7:00pm-8:15pm, April 03, 2020. Location TBA
- **Spring Break**: Monday, March 16-Sunday, March 22, 2020 - No classes.
- **Last Day of Classes** - Full Term Session: Thursday, April 30, 2020.
- **Final Exam**: TBA

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.

MATH 2415 WebAssign Instructions:

To gain access to WebAssign:

1. Log into eLearning, and select the course

MATH 2415.701 - Calculus of Several Variables - S20

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

3. If you already have a WebAssign account, you will either see the course **MATH 2415.701-Calculus of Several Variables -S20** or can choose it from the pull-down menu.

4. If you do not already have a WebAssign account, you will have 3 options to register.

   - Enter an access code if you have already purchased it.
   - Purchase the access onsite using a credit card/bank account.
   - Continue the **trial period** (expiration date will be given in red).

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

MATH 2415.701 - Calculus of Several Variables - S20

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Friday Problem Sections Information:

Problem Section	Location	Time	Teaching Assistant (TA)	ULA
MATH 2415.301	CB1 1.106	8-9:50 am	Bradley Meyer	Brian Jensen
MATH 2415.302	FN 2.202	8-9:50am	Aparajita Singh	Viren Bhosale
MATH 2415.303	CB1 1.106	10-11:50am	Bradley Meyer	Anna Rasmussen
MATH 2415.304	FN 2.202	10-11:50am	Aprajita Singh	Alex Taylor
MATH 2415.305	CB1 1.106	1-2:50pm	Sonam Lama	Brandon Salazar
MATH 2415.306	FN 2.202	1-2:50pm	Mohammadmehdi Akhavan	Anya Sagues
MATH 2415.307	CB1 1.106	3-4:50pm	Sonam Lama	Brandon Salazar
MATH 2415.308	CB3 1.308	3-4:50pm	Mohammadmehdi Akhavan	Anya Sagues
MATH 2415.309	FO 2.404	10-11:50am	Joseph Santantasio	Mia Kim

Teaching Assistants Information:

Name	Office	Office hours	Email
Bradley Meyer	FO 1.204	Tue 4-6pm	Bradley.Meyer@utdallas.edu
Aprajita Singh	BSB 11.419	TR 4:15-5:15pm	Aprajita.Singh@UTDallas.edu
Sonam Lama	FO 1.204	Wed 1-3pm	Sonam.Lama@utdallas.edu
Mohammadmehdi Akhavan	FO 2.602		mxa154630@utdallas.edu
Joseph Santantasio			Joseph.Santantasio@UTDallas.edu