MATH 2415 CALCULUS OF SEVERAL VARIABLES
Syllabus-Spring 2018

Class Information:

Class Section	Location	Days	Time	Instructor
MATH 2415.001	GR 3.420	Tue, Thu	8:30-9:45 am	Dr. Rabin Dahal
MATH 2415.002	JSOM 1.217	Tue, Thu	11:30am-12:45pm	Dr. Changsong Li
MATH 2415.003	GR 2.302	Tue, Thu	2:30-3:45pm	Dr. Rabin Dahal

Instructor Information:

Instructor: Dr. Rabin Dahal	Instructor : Dr. Changsong Li
Office: FO 2.110	Office: FO 2.108
Office Hrs: TR 1-2pm, W 9-11am & by appt.	Office Hrs: Tue 2-4pm & by appt.
Email: `Rabin.Dahal@utdallas.edu`	Email: `changsong.li@utdallas.edu`
Telephone: (972) 883 6584	Telephone: (972) 883 6034

Teaching Assistants Information:

Name	Office	Office hours	Email
Arafat Khan	FN 3.118A	Fri 12-1pm	`arafat@utdallas.edu`
Samreen Khan	FN 3.118	Fri 12-1pm	`Samreen.Sher@utdallas.edu`
Jonathan Popa	FO 1.210	Mon 2-3pm	`jonathan.popa1@utdallas.edu`
Vrushaly Shinglot	FO 3.118		`Vrushaly.Shinglot@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.(3 lecture hours and 2 problem session 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 sessions MATH 2415.30x in addition to the lecture sections MATH 2415.00x.

- Students are automatically enrolled in MATH 2415.701 exam section which meets in exam days only.

Textbook and Materials:

- **Textbook:** Calculus: Early Transcendentals, 8th 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, 16.1-16.7, and 16.8-16.9.

eLearning:

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

$$\text{https://elearning.utdallas.edu}$$

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.

$$\text{http://www.utdallas.edu/studentsuccess/help-with-courses/peer-led-team-learning/}$$

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:

$$\text{http://www.utdallas.edu/studentsuccess/mathlab/}$$

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 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 relative extrema(if any) 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, and curl of a function at a given point.

7. Students will be able to compute the line integrals of a function along a curve using Green's, Stokes', and Divergence 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 the following Wednesday.
   - 2 lowest DHW scores will be dropped at the end of the semester.
   - DHW is worth 15% towards your final grade.

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

   - A pdf file of weekly Paper Homework(PHW) consisting of a list of textbook problems will be posted each week on eLearning.
   - You must print the pdf of PHW, write your solutions in the space provided, staple it, and turn in at the beginning of the problem sessions.
   - You must show all of your work to earn full credit. Correct answers with insufficient 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 will be graded but you will not be told in advance which one.
   - PHW will count as 15% towards your final grade.
   - 2 lowest PHW will be dropped.

3. **Mid-Term Exams:**

   - Exam I: Feb 16, Friday 7:00pm-8:15pm; Location: TBA
   - Exam II: March 30, Friday 7:00pm-8:15pm; Location: TBA
   - Each midterm exam counts 20% towards your final grade.

4. **Final Exam**

   - Date: May 02, 2018, Wednesday 2:00pm-4:45pm
   - 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. **Participation in Problem Sessions:** 5% of your grade will be given by teaching assistants based on your active participation on the Friday Problem Sessions. The whole class will be divided into several groups of 3 and each group will work on assigned problems on the white board. The teaching assistants will monitor your progress and may give you some ideas 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 points if you arrive in the first 10 minutes, leave no more than 20 minutes early and actively participate.

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.

- 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.

CALCULATORS

- Calculators are not allowed in the exams.

GRADING SCHEME

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  - Two midterm exams: 20% each
  - Digital Homework: 15%
  - Paper Homework: 15%
  - Active participation in Problem Sessions: 5%
  - Final exam: 25%

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

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

Tentative Schedule

Tuesday	Wednesday	Thursday	Friday
Jan 9th **1** Sec 12.1, 12.2	10th **2**	11th **3** Sec 12.3	12th **4**
16th **5** Sec 12.4	17th **6** DHW#1 Due	18th **7** Sec 12.5	19th **8** PHW#1 Due
23rd **9** Sec 12.6	24th **10** DHW#2 Due	25th **11** Sec 13.1	26th **12** PHW#2 Due
30th **13** Sec 13.2, 13.3	31st **14** DHW#3 Due	Feb 1st **15** Sec 14.1	2nd **16** PHW#3 Due
6th **17** Sec 14.3	7th **18** DHW#4 Due	8th **19** Sec 14.4	9th **20** PHW#4 Due
13th **21** Sec 14.5	14th **22** DHW#5 Due	15th **23** Sec 14.6	16th **24** Review, Exam#1
20th **25** Sec 14.7	21st **26** DHW#6 Due	22nd **27** Sec 14.7	23rd **28** PHW#5 Due
27th **29** Sec 14.8	28th **30** DHW#7 Due	Mar 1st **31** Sec 15.1	2nd **32** PHW#6 Due
6th **33** Sec 15.2	7th **34** DHW#8 Due	8th **35** Sec 15.3	9th **36** PHW#7 Due
13th **37** Spring Break	14th **38** Spring Break	15th **39** Spring Break	16th **40** Spring Break
20th **41** Sec 15.6	21st **42** DHW#9 Due	22nd **43** Sec 15.7	23rd **44** PHW#8 Due
27th **45** Sec 15.8	28th **46** DHW# 10 Due	29th **47** Sec 15.9	30th **48** Review, Exam#2

	Tuesday		Wednesday		Thursday		Friday
Apr 3rd **49** Sec 16.1		4th **50** DHW#11 Due		5th **51** Sec 16.2		6th **52** PHW#9 Due	
10th **53** Sec 16.3		11th **54** DHW#12 Due		12th **55** Sec 16.4		13th **56** PHW# 10 Due	
17th **57** Sec 16.5		18th **58** DHW#13 Due		19th **59** Sec 16.6		20th **60** PHW# 11 Due	
24th **61** Sec 16.7		25th **62** DHW# 14 Due		26th **63** Sec 16.8, 16.9		27th **64** PHW#12 Due	
May 1st **65**		2nd **66** Final Exam		3rd **67**		4th **68**	

Important Dates

- Monday, January 8, 2018: Classes begin
- Monday, January 15, 2018: Martin Luthar King Day- No class.
- Wednesday, January 24, 2018: Last Day to Drop a class without a "W" Full Term Session
- **Midterm Exam I**: Friday 7:00pm-8:15pm, February 16, 2018. Location TBA
- **Spring Break**: Monday, March 12, 2018- Sunday, March 18- No classes.
- **Midterm Exam II**: Friday 7:00pm-8:15pm, March 30, 2018. Location TBA
- **Last Day of Classes** - Full Term Session: Wednesday, Sunday, April 29, 2018.
- **Final Exam**: Wednesday, 2:00pm – 4:45pm, May 02, 2018. Location: 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.

Friday Problem Sessions Information:

Problem Section	Location	Time	Graduate TA	Undergraduate TA
MATH 2415.301	CB3 1.312	8-9:50 am	Arafat Khan	Kinnari Karia
MATH 2415.302	CB3 1.306	8-9:50am	Samreen Khan	Andrew Marder
MATH 2415.303	FO 1.502	10-11:50am	Samreen Khan	Andrew Marder
MATH 2415.304	CB1 1.104	10-11:50am	Arafat Khan	Jenny Foster
MATH 2415.305	CB 1.222	1-2:50pm	Jonathan Popa	Jenny Foster, David Maynard
MATH 2415.306	CB3 1.312	1-2:50pm	Vrushaly Shinglot	Lara Lelina (Danika)
MATH 2415.307	CB 1.222	3-4:50pm	Jonathan Popa	Uzair Sanjrani
MATH 2415.309	FN 2.202	10-11:50am	Vrushaly Shinglot	Lara Lelina(Danika)

MATH 2415 WebAssign Instructions:

To gain access to WebAssign:

1. Log into eLearning, and select the course

MATH 2415.701 - Calculus of Several Variables - S18

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 WebAssign course **MATH 2415-Calculus of Several Variables - S18** at the left or you will see a pull-down menu with courses listed; choose

MATH 2415 - Calculus of Several Variables - S18

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 - S18

(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 an access code.
- 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 - S18

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