MATH 2415 CALCULUS OF SEVERAL VARIABLES
Syllabus-Summer 2024

Class Information:

Class Section	Location	Days	Time	Instructor
MATH 2415.0U1	SCI 3.250	Monday, Wednesday	12:30 pm - 2:45 pm	Irina Martynova
MATH 2415.0U2	SCI 3.260	Monday, Wednesday	3:00 pm - 5:15 pm	Oleg Makarenkov

Instructor Information:

Office: FO 2.108	Email: irina.martynova@utdallas.edu
Phone: 9728834529	Office Hours: Wednesday, 10:00 am-12:00 pm and by appointment
Office: FO 2.610C	Email: makarenkov@utdallas.edu
Phone: 9728834617	Office Hours: Wednesday, 5:30 pm-6:30 pm

Problem Section Information:

Problem Section	Location	Days	Time	Teaching Assistants
MATH 2415.8U1	FN 2.202	Monday	5:30 pm-7:45 pm	Kumar Surbhi, Zhou Changkai
MATH 2415.8U2	SCI 3.260	Monday	5:30 pm-7:45 pm	Akter Rozina, Hensley Travis

Teaching Assistants Information:

Teaching Assistant	Office	Office hours	Email
Surbhi	BSB 1.419F	M/T 3:00 pm – 4:00 pm	surbhi.kumar@utdallas.edu
Changkai	FO 1.210A	M/W 1:00 pm – 2:00 pm	changkai.zhou@utdallas.edu
Akter	FO 1.210	W 1:00 pm – 3:00 pm	rozina.akter@utdallas.edu
Travis	FO 1.404P	W 4:00 pm – 5:00 pm	tyler.hensley@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 (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 sections MATH 2415.8u1 or MATH 2415.8u2 in addition to the lecture sections MATH 2415.0u1 or MATH 2415.0u2.

Textbook and Materials:

- **Recommended Textbook:** Calculus: Early Transcendentals, 9th edition, James Stewart.

- **WebAssign:** You must have **WebAssign** access to complete digital homework (DHW). To gain access to WebAssign you must purchase an access code. Here are some options that you can choose when purchasing an access code:

1. Single-term WebAssign printed access card (contains eBook): ISBN: 9781337771467
2. Multi-term WebAssign printed access card (contains eBook): ISBN: 9781337771474
3. Loose-leaf textbook + multi-term WebAssign access: ISBN: 9781305616691
4. Bundle: Hardcover textbook + multi-term WebAssign access: ISBN: 9781305597624
5. Cengage Unlimited, 1 term (4 months) Instant Access: ISBN: 9780357700006

WebAssign includes an electronic version of the textbook, so you are not required to buy a physical copy.

- **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, 16.1-16.6.

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eLearning:

You must regularly check the MATH 2415.701 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.

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 in the direction of another vector.

2. Given an algebraic or parametric or vector equation, the students will be able to identify 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 the method of 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.

Grading Policy:

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.
   - To access WebAssign for DHW you should log into the course MATH 2415.701 on eLearning.
   - The lowest DHW score will be dropped at the end of the semester.
   - DHW is worth 10% toward your course grade.

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

   - A pdf file of weekly Paper Homework (PHW) will be posted each week on eLearning course MATH 2415.701 every Tuesday and will be due at 11:59pm the following Wednesday. You must print the pdf of PHW, write your solutions in the space provided, scan it, and upload it on eLearning. Create a single pdf file to upload.
   - You must show all 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 classmate. Collaboration is encouraged. However, the final writes 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 10% toward your course grade.
   - The lowest PHW will be dropped.

   Note: Unexpected events (such as power outage, internet outage, eLearning malfunction, other personal emergencies etc.) may occur at any time. So, we suggest you plan to submit each PHW or DHW at least 24 hours before it is due so that you will still have time to find an alternate method of submitting these assignments before they are due.

3. **Quizzes:**

   - Quizzes will be given during the last 25 minutes of your problem sections.
   - You must show all your work to earn full credit. Correct answers without sufficient supporting work will receive no or reduced credit.
   - The quiz average will count as 10% toward your course grade.
   - The lowest quiz will be dropped.

4. **Mid-Term Exams:**

   - Exam I: June 17, Monday 6:00 pm-7:15 pm; Location: Problem Section
   - Exam II: July 15, Monday 6:00 pm-7:15 pm; Location: Problem Section
   - Each midterm exam counts 20% towards your final grade.

5. **Final Exam**

   - Date and Time: TBA
   - Comprehensive but more emphasis will be on the material covered after Exam II.
   - Final exam will count as 25% toward course final grade.

6. **Participation in Problem Sessions:** 5% of your grade will be given by teaching assistants based on your active participation in the Monday 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, 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 4.5 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.

Grading Scheme:

- – Two midterm exams: 20% each
  - – Digital Homework: 10%
  - – Paper Homework: 10%
  - – Quizzes: 10%
  - – 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.

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

Course & Instructor Policies:

1. **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.

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

3. **Class Materials:** The instructor may provide class materials that will be made available to all students registered for this class as they are intended to supplement the classroom experience. These materials may be downloaded during the course; however, these materials are for registered students' use only. Classroom materials may not be reproduced or shared with those not in class or uploaded to other online environments except to implement an approved Office of Student Accessibility accommodation. Failure to comply with these University requirements is a violation of the **Student Code of Conduct**.

4. **Class Attendance:** Regular and punctual class attendance is expected. Students who fail to attend class regularly are inviting scholastic difficulty. If you must miss a class, you are responsible for the material covered in class. You are responsible for any/all assignments regardless of your attendance. Note that attendance and participation in the problem sections is graded.

5. **Class Participation:** Regular class participation is encouraged, however, please raise your hand to speak. Avoid having side conversations and using electronic devices (such as phone, laptop) to prevent unnecessary distractions to yourself and your classmates. You are welcome to use a writing tablet to take lecture notes. Again, note that attendance and participation in the problem sections is graded.

6. **Student Accessibility:** It is the policy and practice of The University of Texas at Dallas to make reasonable accommodation for students with properly documented disabilities. However, written notification from the Office of Student Accessibility (OSA) is required. If you are eligible to receive accommodation and would like to request it for this course, please discuss it with your instructor and allow one-week advance notice. Students who have questions about receiving accommodations, or those who have, or think they may have, a disability (mobility, sensory, health, psychological, learning, etc.) are invited to contact OSA for a confidential discussion. OSA is in the Student Administration Building, AD 2.224. They can be reached by phone at 972-883-2098, or by email at: studentaccess@utdallas.edu

7. **Class Recordings:** Students are expected to follow appropriate University policies and maintain the security of passwords used to access recorded lectures. Unless the Office of Student Accessibility has approved the student to record the instruction, students are expressly prohibited from recording any part of this course. Recordings may not be published, reproduced, or shared with those not in the class, or uploaded to other online environments except to implement an approved Office of Student Accessibility accommodation. Failure to comply with these University requirements is a violation of the **Student Code of Conduct**.

Academic Support Resources

1. Peer Tutoring: The Student Success Center offers free help in math, physics and statistics courses to the UT Dallas students currently enrolled in classes. Please visit their website:

   https://studentsuccess.utdallas.edu/programs/peer-tutoring/

   for detailed information.

Please visit the following webpage for the full list of University's academic support resources for all students. Please see:

   http://go.utdallas.edu/academic-support-resources

Important Dates

- **Classes begin:** Wednesday, May 29.
- Wednesday, June 12: Last Day to Drop a class without a "W" Full Term Session
- **Midterm Exam I**: Monday, June 17, 6:00 pm-7:15 pm. Location: Problem Section
- **Juneteenth:** Wednesday, June 19: No classes.
- **Independence Day:** Thursday, July 04: No classes.
- **Midterm Exam II**: Monday, July 15, 6:00 pm-7:15 pm. Location: Problem Section
- **Last Day of Classes** - Full Term Session: Wednesday, August 07.
- **Final Exam**: TBA.

Tentative Schedule

Monday		Wednesday	
May 27th Memorial Day, No classes	**1**	May 29th Lec: 12.1, 12.2	**2**
June 3rd Lec: 12.3, 12.4 PS: 12.3, 12.4, 12.5; Quiz 1	**3**	June 5th Lec: 12.5 PHW 1 Due, DHW 1 Due	**4**
June 10th Lec: 12.5, 12.6 PS: Exam 1 Review	**5**	June 12th Lec: 13.1 PHW 2 Due, DHW 2 Due	**6**
June 17th Lec: 13.2, 13.3	**7**	June 19th Juneteenth: No Classes PHW 3 Due, DHW 3 Due	**8**
June 24th Lec: 14.1, 14.3 PS: 14.1, 14.3, 14.4, 14.5, Quiz 2	**9**	June 26th Lec: 14.4, 14.5 PHW 4 Due, DHW 4 Due	**10**
July 1st Lec: 16.6 (Parametric Surface), 14.6 PS: 16.6, 14.6, 14.7, Quiz 3	**11**	July 3rd Lec 14.7 PHW 5 Due, DHW 5 Due	**12**
July 8th Lec: 14.8, 15.1 PS: Exam 2 Review	**13**	July 10th Lec: 15.2 PHW 6 Due, DHW 6 Due	**14**
July 15nd Lec 15.3, 15.6 PS: 15.3, 15.6, 15.7, 15.8, Quiz 4	**15**	July 17th Lec: 15.7, 15.8 PHW 7 Due, DHW 7 Due	**16**
July 22nd Lec: 15.9 PS: 15.9, 16.1, 16.2, Quiz 5	**17**	July 24th Lec: 16.1, 16.2 PHW 8 Due, DHW 8 Due	**18**
July 29th Lec: 16.3, 16.4	**19**	July 31st Lec: 16.5, 16.6, Quiz 6 PHW 9 Due, DHW 9 Due	**20**
Aug 5th Lec: 16.6, Final Exam Review	**21**	Aug 7th Final Exam Review. Last day of classes.	**22**

MATH 2415 WebAssign Instructions:

To gain access to WebAssign:

1. Log into eLearning, and select the course

MATH 2415.701 - Calculus of Several Variables - Su24

2. Click on "Assignments" on the left panel, you will see the link **"Access WebAssign"**.

3. If you already have a WebAssign account, you will either see the WebAssign course

MATH 2415-Calculus of Several Variables - Su24

at the left or you will see a pull-down menu with courses listed; choose

MATH 2415 - Calculus of Several Variables - Su24

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 - Su24

   (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 take the WebAssign course.

MATH 2415 - Calculus of Several Variables - Su23

UT Dallas Syllabus Policies and Procedures:

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus. Please go to

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

for these policies.

Comet Creed

This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:

"As a Comet, I pledge honesty, integrity, and service in all that I do."

Note: The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professors.