MATH 2415

Course Syllabus

Spring 2022 **CALCULUS OF SEVERAL VARIABLES**

MATH 2415.001	TR	10:00am - 11:15am	FO 2.208	EYDELZON
MATH 2415.002	TR	04:00pm - 05:15pm	GR 2.530	COSKUNUZER
MATH 2415.003	TR	01:00pm - 02:15pm	FN 2.102	EYDELZON
MATH 2415.004	TR	08:30am - 09:45am	GR 2.302	EYDELZON
MATH 2415.301	F	08:00am - 09:50am	SCI 2.210	
MATH 2415.302	F	01:00pm - 02:50pm	SCI 2.210	
MATH 2415.303	F	03:00pm - 04:50pm	SCI 2.210	
MATH 2415.305	F	01:00pm - 02:50pm	SCI 2.215	
MATH 2415.306	F	10:00am - 11:50am	SCI 2.225	
MATH 2415.307	F	01:00pm - 02:50pm	SCI 2.225	
MATH 2415.308	F	03:00pm - 04:50pm	FO 2.702	
MATH 2415.701	F			

Instructor Information

Dr. Baris Coskunuzer Office: FA 2.410 E-mail: coskunuz@utdallas.edu Office hours: T 1:00pm – 2:00pm, R 11:00am–12:00pm	Dr. Anatoly Eydelzon Office: FO 2.604G E-mail: anatoly@utdallas.edu Office hours: W 9:00am – 12:00pm or by appointment

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

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

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).

Student Learning Objectives/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.

Required Textbooks, Materials and Additional Resources

Text: Calculus (Early Transcendentals), Eighth Edition, by James Stewart, Chapters 12-16. (Do not purchase the 7th edition!) A less expensive Electronic Version is also available. You must have WebAssign access.
Some Options:

1. Access code to Enhanced WebAssign (contains digital copy of the text)
   ISBN: 9781285858265
2. Loose leaf copy of the text bundled with EnhancedWebAssign access code
   ISBN: 9781305616691
3. Hardbound text bundled with Enhanced WebAssign access code
   ISBN: 9781305597624

Online Resources: We encourage you to make use of the online video lectures and other resources developed by MIT and the Khan Academy.

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

Schedule (subject to change). Examination weeks are in red.

Wk	T		R		F	
1	1/18	12.1, 12.2	1/20	12.3	1/21	
2	1/25	12.4	1/27	12.5	1/28	
3	2/1	12.5, 12.6	2/3	13.1	2/4	
4	2/8	13.2, 13.3	2/10	14.1	2/11	
5	2/15	14.3, 14.4	2/17	14.4, 14.5	2/18	Midterm 1
6	2/22	14.6	2/24	14.7 (local extrema)	2/25	
7	3/1	14.7 (global extrema)	3/3	14.8	3/4	
8	3/8	15.1	3/10	15.2	3/11	
9	3/15	Spring Break	3/17	Spring Break	3/18	Spring Break
10	3/22	15.3	3/24	15.6	3/25	Midterm 2
11	3/29	15.7	3/31	15.8	4/1	
12	4/5	15.9	4/7	16.1	4/8	
13	4/12	16.2 (functions)	4/14	16.2 (vector fields)	4/15	
14	4/19	16.3	4/21	16.4	4/22	Midterm 3
15	4/26	16.5	4/28	16.6	4/29	
16	5/3	16.7	5/5	16.8, 16.9		

Grade Policy

The course grade is determined from the following:

Weights:	15%	DHW (Digital Homework) due every Wednesday at 23:59pm
	15%	PHW (Paper Homework) due every Friday at 23:59pm
	15%	Midterm 1 (2/18/2022)
	15%	Midterm 2 (3/25/2022)
	15%	Midterm 3 (4/22/2022)
	25%	Final Examination (TBA)

Up to 5 extra points (on the top of the class grade) will be added for Problem Section participation.

Exam/Homework policies

(a) There will be no make-up homework assignments.
(b) The lowest DHW and the lowest PHW will be dropped.
(c) There will be no make-up exams unless the circumstances are extraordinary.
(d) Exams and quizzes are closed book, notes, no calculators.

Official UTD Policies

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

These policies are considered to be a part of this syllabus.