MATH 2450: Calculus III with Applications
Section CO1 — Fall 2020

Instructor Information

Name: Dr. Anthony Gruber
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Office Hours: T/R 10-11 AM, R 1-2 PM, or by appointment.

Class Information

Dates: Tuesdays and Thursdays
Time: T/R 3:00 - 4:20 PM, T 1:00 - 1:50 PM
Classroom: Zoom meeting ID 390 313 783
Website: https://blackboard.ttu.edu
Textbook: Calculus (7th edition), Smith, Strauss, and Toda
Prerequisites: MATH 1452

Course Description

Partial differentiation, functions of several variables, multiple integrals, line integrals, surface integrals, Stokes' Theorem. Applications and problem-solving are strongly emphasized. Partially fulfills Core Mathematics requirement.

Mission Statement

Mission Statement. This course covers Calculus of several variables. The concepts are extensions of the concepts from Calculus I. It is necessary to remind the students of those basic concepts, as the course progresses. Multivariable Calculus is an important tool in Science and Engineering. The instructor should emphasize the importance of all relevant concepts, including: curves and surfaces in Euclidean 3-space, length and curvature, area and volume; surfaces, partial derivatives, total differential, tangent planes to surfaces; gradient; vector-valued functions; path integral; Stokes'; theorem, which should be stated, with an emphasis on its important particular cases, Green's Theorem and Divergence Theorem - followed by a few basic examples. This course is organized as a four hour lecture for the regular academic year (Fall and Spring) and the corresponding amount of hours for each Summer Session. Each hour will be devoted to covering the material from the textbook integrated with applications, examples and exercises that are relevant to the learning objectives, and improve the student success in the examinations. Depending on availability of academic facilities, the fourth hour of lecture can be held in a regular classroom, a lecture hall, or a computer lab, where the students will follow the instructor's presentation and become actively involved in problem-solving at the same time.

Course Objectives

Math 2450 satisfies the university core curriculum requirement in Mathematics: "Students graduating from Texas Tech University should be able to demonstrate the ability to apply quantitative and logical skills to solve problems." It meets the TTU general education student learning outcomes for mathematics that students will: apply arithmetic, algebraic, geometric, statistical and logical reasoning to solve problems; represent and evaluate basic mathematical and/or logical information numerically, graphically, and symbolically; interpret mathematical and/or logical models such as formulas, graphs, tables and schematics, and draw inference from them. Students develop skills in differentiation and integration needed to solve problems in 3-dimensional space. In particular the students will master concepts including but not limited to:

- Tangent and normal vector fields, curvature of plane and parametric curves.

- Gradients, directional derivatives, and differentiability of multivariable functions.

- Integration in 2 and 3 variables; integration in cylindrical and spherical polar coordinates.

- Calculus involving vector fields; line integrals, path independence, Green's theorem, Stokes' theorem.

Methods of Learning Assessment

Graded assessment is done through homework, quizzes, and exams. Other assessment techniques include direct questioning, problems to be solved in class, and discussions during office hours.

Homework: Homework will be assigned regularly through the online system WeBWorK at the url https://webwork.math.ttu.edu/webwork2/f20agruberm2450sC01/. Students should **check this page regularly** to manage assignments and deadlines. Late homework will not be accepted under any circumstances.

Quizzes: 15-minute quizzes will be given periodically at the start of class. These may be announced or unannounced. At the end of the course, each student's lowest quiz grade will be dropped from the final grade calculation.

Exams: There will be two in-class midterms, tentatively scheduled for the 7th and 13th weeks of the semester. There will also be a comprehensive final examination held at the end of the course. Missed exams can **only** be made up if there is a valid and documented, university-approved reason.

Grading

The final grade will be determined based on the following percentages.

Homework:	24%
Quizzes:	15%
Exam 1:	18%
Exam 2:	18%
Final Exam	25%

Tentative Schedule

The following is a *tentative* schedule for the course.

Sections	# Hours
9.1-9.7	6
10.1-10.2, 10.4	5
11.1-11.8	11
12.1-12.5, 12.7-12.8	12
13.1-13.7	11

Course and University Policies

Attendance: The faculty at Texas Tech University-Costa Rica requires prompt attendance at all class meetings. In other words, attendance in class is a universal requirement. Three unexcused absences will result in the reduction of the grade by one half grade. Two tardy arrivals are equivalent to one absence. Leaving classes early will also be taken as an absence unless previous written permission is given. You are responsible for all material covered and announcements made in lecture, via email, and on the course website. If less than 3 classes are missed, two bonus points will be added to the final average.

Academic Honesty (OP 34.12): It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and high standard of integrity. The attempt of students to present as their own any work not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offenders liable to serious consequences, possibly suspension. "Scholastic dishonesty" includes, but it not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor) or the attempt to commit such an act.

ADA Accommodation (OP 34.22): Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor's office hours. Please note that instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, you may contact the Student Disability Services office at 335 West Hall or 806-742-2405.

Religious Holy Day Observance (OP 34.19): "Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Texas Tax Code §11.20. A student who intends to observe a religious holy day should make that intention known to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. A student who is excused may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily.

Civility in the Classroom: Texas Tech University endeavors to foster a classroom climate of mutual respect among students and between students and teacher. Mutual respect means that we should be tolerant of different ideas and varying opinions about topics of discussion in class, that we address each other respectfully and without interrupting while others are speaking, and that we do not engage in disruptive behavior in class. Signs of disrespect include, but are not restricted to: ringing cell phones (students must turn them off or leave them home), reading a newspaper or other material that is not part of a class assignment while in class, talking with classmates during class, eating and drinking in class***, and similar disruptive behaviors. Students who engage in disruptive behavior will be warned. Repeated disruptive behavior may result in the student being asked to leave the classroom.

*** I do not mind if you eat/drink in class, but please be considerate about it.

Important Dates

- Drop Deadline (no penalty): Sept. 9

- Independence Day: Sept. 14

- Withdrawal Deadline (academic penalty): Nov. 24

- Thanksgiving Holiday: Nov. 26-27

- Abolition of the Army: Nov. 30

- Final Exam: Dec. 8, 7:30-10:00 AM