MATH 2450, Section 018
Fall 2017
Calculus III with Applications

Instructor: Anthony Gruber

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> **IMPORTANT:** if you E-mail me through this address you **MUST** begin your subject line with "Math 2450:" or I do not guarantee it will be read. Otherwise, you can E-mail me through the "E-mail Instructor" feature on the class blackboard site at blackboard.ttu.edu.

Lectures: M 2:00-3:50; W/F 3:00-3:50 PM

Office Hours: M/F 10:00 AM – 11:00 AM, W 10:00 AM – 12:00 PM, or by appointment.

Text: K. Smith, M. Strauss, M. Toda, *CALCULUS*, 6th edition.

Prerequisites: C or better in Math 1352 or Math 1452 or departmental permission

About the course: 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.

Material Covered:
Chapter 9 – Vectors in the Plane and in Space, 9.1–9.4 and 9.5–9.7
Chapter 10 – Vector-Valued Functions, 10.1–10.2, 10.4
Chapter 11 – Partial Differentiation, 11.1–11.8
Chapter 12 – Multiple Integration, 12.1–12.5, 12.7–12.8
Chapter 13 – Vector Analysis, 13.1–13.7

Mission Statement: This course covers Calculus of several variables. The concepts are extensions of the concepts from Calculus 1. 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 particular cases: Green's Theorem and the 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.

Student Learning Outcomes: Math 2450 meets the TTU general education student learning outcomes for mathematics. Students will (1) apply arithmetic, algebraic, geometric, statistical, and logical reasoning to solve problems, (2) represent and evaluate basic mathematical and/or logical information numerically, graphically, and symbolically, and (3) interpret mathematical and/or logical models such as formulae, graphs, tables, and schematics, and draw inference from them.

Course Specific Learning Outcomes: The purpose of this course is to build a bridge from elementary calculus to higher mathematical analysis, and to provide a firm base of knowledge in the the fundamentals of multivariable differential calculus. Students will develop skills in differentiation and integration needed to solve problems in three-dimensional space. The student will master the concepts of (1) tangent and normal vectors, (2) partial derivatives, tangent planes, directional derivatives, and gradients, and how to compute them, (3) three-dimensional integration and computation of integrals, (4) vector fields, divergence, curl, and their applications to the science

Method of Assessment:

(1) Online (WeBWorK) Homework   **20%**
   And (possible) Quizzes:

(2) Exam 1:   **17%**
   Exam 2:   **17%**
   Exam 3:   **17%**

(3) Final Exam: **30%**

Attendance will be taken each day and will be considered in borderline cases.

Homework: Homework will be assigned weekly and graded through WeBWorK. URL: http://webwork.math.ttu.edu/webwork2/f17agruberm2450s010s018/

Quizzes, if given, will be short (15 minutes or so of class), may or may not be announced beforehand, and will be equal to one homework grade.

Exams will be one whole long class period. Additionally, ***students must provide their own paper for exams***. There will be no make-up exams unless you miss for a valid _verified_ reason (e.g. personal health problem, death in the family) in which case you must schedule a different time within one week. There will be **no calculators allowed on any exam**.

Note: At the end of the semester, the lowest grade in Category **(1)** will be dropped.

Letter Grades:

The following cutoffs will be used as the _strictest possible_ cutoffs for letter grades. Exam averages and exam score distributions will be made public and adjustments may be made throughout the semester.

A: 90-100%   **B:** 80-89%   **C:** 70-79%   **D:** 60-69%   **F:** <60%

Support for Student Learning:

Calculus 3 Supplemental Instruction Sessions, MATH 017 (FREE)
http://www.depts.ttu.edu/soar/SI/includes/SI_Schedule.pdf

Math Tutoring and Study Center, Math 106, Monday-Friday: 9AM-4PM (FREE)

Texas Tech Operating Policies and Procedures: The following three items are brief excerpts. The complete policies are available at http://www.depts.ttu.edu/opmanual/.

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 endeavor 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 University Dates:

September 4th	Labor Day Holiday
September 13th	Last day to drop (without penalty)
October 30th	Last day to drop (with penalty)
November 22nd – 26th	Thanksgiving Holiday
December 6th	Last Class Day
December 8th	Final Exam