

**MATH 2450, Section C01**  
**Spring 2020**  
**Calculus III with Applications**

**Instructor:** Anthony Gruber, Ph.D.

**Office:** 315 D

**E-mail:** [anthony.gruber@ttu.edu](mailto:anthony.gruber@ttu.edu) ;

**IMPORTANT:** When e-mailing me through this address, please follow the subject line convention “Math 2450: <your title here>” so that it is filtered to the correct place in my inbox.

**Lectures:** 9:30 – 10:50 TR, 11:00 – 11:50 T.

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

**Text:** K. Smith, M. Strauss, M. Toda, *CALCULUS*, 7<sup>th</sup> edition.

**Prerequisites:** C or better in 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.

**Course Webpage:** hosted at <https://ttu.blackboard.com>

**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 the Calculus of several variables, which is an important tool for science and engineering applications. The concepts are extensions of the relevant concepts from Calculus 1. It is necessary to remind the students of those basic concepts as the course progresses. 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 science.

**Method of Assessment:**

(1) Online (WeBWork) Homework	15%
(2) In-class Quizzes	15%
(3) Attendance & Participation	11%
(4) Exam 1 2/4:	13%
Exam 2 3/3:	13%
Exam 3 3/31:	13%
(5) Final Exam 5/12:	20%

**Homework** will be assigned regularly and graded through the online system WeBWork. Check the following URL frequently to stay up to date on the course assignments.

**URL:** <https://webwork.math.ttu.edu/webwork2/spr20agruberm2450sC01/>.

**Quizzes** will be 15-20 minutes in length and will occur roughly once per week. At the end of the semester, the lowest grade in this category **(2)** will be dropped.

**Attendance** will be taken every day, and those who are not present within 5 minutes of the class starting time will be marked absent. Every absence after the 1<sup>st</sup> will result in a reduction of 3% from category **(3)**. Moreover, you are expected to be attentive and engaged during the class. Activities such as sleeping, chitchatting with neighbors, and playing on electronic devices will result in a reduction to your participation score, on the order of 1% for each offense.

**Exams** will be one 80-minute class period long (except for the final, which is 2.5 hours), administered by me in our usual classroom. If you have a problem with any of the dates above, **notify me immediately** so that we can schedule an earlier time for you to take the exam. Note that there will be no make-up exams allowed after the exam dates above. Additionally, there will be no calculators allowed on any exam.

**Note:** Use of cell phones and laptops is prohibited during class time.

### **Letter Grades:**

The following cutoffs will be used as the *strictest possible* cutoffs for letter grades. Further adjustments downward may be made throughout the semester depending on the performance of the class.

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

**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 is 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:**

January 31 <sup>st</sup>	Last day to drop (without penalty)
Mar. 18 <sup>th</sup> – Mar. 20 <sup>th</sup>	Spring Holiday (no class)
April 22 <sup>nd</sup>	Last day to drop (with penalty)
April 4 <sup>th</sup> – April 13 <sup>th</sup>	Holy week (no class)
May 12 <sup>th</sup> 1:30 – 4:00 PM	Final Exam