Instructor: Eugenio Aulisa, Associate Professor  
Office: MATH 222; Office Phone: (806)834-6684  
E-mail: eugenio.aulisa@ttu.edu;  
Office hours: daily throughout email exchange,  
face-to-face meetings have to be scheduled in advance  
and are reserved to discussions that go beyond class material.


For some students “just reading the book” will not be enough to prepare them to work homework problems  
and do well on exams.  
a) The instructor will send links to videos for most sections covered.  
b) The instructor will send hand-written class-notes

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.

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.

Student Learning Outcomes. 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 the concepts of  
• tangent and normal vectors, and their geometric and physical interpretations;  
• partial derivatives, tangent planes, directional derivatives, and gradients, and how to compute them;  
• three-dimensional integration, and how to compute such integrals;  
• vector fields, divergence, and curl, and how to calculate them.

Assessment of the Learning Outcomes:

Homework will be given regularly on the WebWork system at http://webwork.math.ttu.edu/webwork2/spr15eaulisam2450sD01/. Students will be informed by the instructor via email (on the @ttu.edu address) about the HW, which should be completed before the given deadline (generally not more than 1 week).

Homework is worth 20% of the final grade. However in order to pass the class your overall grade in the HW at the end of the semester should be at least 50%. This may appear radical, but besides the exams, the HW system is a major tool the instructor has to asses your class performances. The instructor will check regularly your HW score and let you know if you are not on track.

Examinations: Exam #1: Wed, February 11, 5:30-6:30 worth 15% of the final grade  
Exam #2: Wed, March 11, 5:30-6:30 worth 20% of the final grade  
Exam #3: Wed, April 22, 5:30-6:30 worth 20% of the final grade  
Final Exam: Mon, May 11, 10:30-1:00 worth 30% of the final grade
Exam Policies: Students are expected to take the midterm exams and the final exam as scheduled. Students who live close enough to Lubbock (75 miles around Lubbock) will have to take the midterm exams and final exam at Texas Tech University in Lubbock at the Mathematics and Statistics department. If students have a conflict in schedule or are far away from Lubbock, they need to provide necessary documentation, and arrange a different place and/or time for examination. In that case, depending on their geographic location, each student should make arrangements with a certified testing service. In case no agreeable solution can be found, the Texas Tech University Testing Services in Lubbock will be designated to administer the examination. Testing centers (including the TTU Testing Center) charge a fee to administer the exam.

Use of calculators and formula sheets in all the exams is not permitted. Electronic devices which can store formulas, including cell phones, should be turned off and stored during the exams.

Grading Policy: less than 60% F, 60-69% D, 70-79% C, 80-89% B, 90-99% A, 100% or more A+

Class Policies: this is a distance class, all the students enrolled in this class should be highly responsible in managing their schedule. This course moves very fast. If you fall behind, even by one section, you may not be able to catch up, since each section generally depends very heavily on the ones before.

A student enrolled in this class has to be capable to read and understand the textbook. If in the past you struggled in self-lecturing mathematics, then this is not the class for you and it is highly recommended you switch to a face-to-face class. The instructor expects for the student to read each section of the textbook, watch the videos and read the class-notes before attempting to solve the homework problems.

When asking for help you need to show all your work, by typing it on the email (better) or by attaching a scanned copy of your work. When asking for help for a WebWork problem it is recommended you use the button email to the instructor at the bottom of the screen, otherwise you may not get any answer.

Make ups. There are no make ups for the examinations, except for reasons of illness, stated in writing by a medical doctor, or observance of a religious holiday. Usually, no other reasons are accepted (events, plane tickets, weddings, ...).

ADA accommodations (TTU Operating Policy 34.22). Any student who, because of a disability, may require some special arrangements in order to meet 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 instructors are not allowed to provide classroom accommodations to 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.

Absence for observance of a religious holy day (TTU Operating Policy 34.19). 1. “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. 2. 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. 3. A student who is excused under Section 2 may not be penalized for the absence; however, the instructor may respond appropriately if the student fails to complete the assignment satisfactorily.

Academic Honesty (TTU Operating Policy 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.

The grade of “I” (TTU Operating Policy 34.12). The grade of “I” is given only when a student's work is satisfactory but due to reasons beyond his or her control, cannot not be completed. It is not given in lieu of an “F” or “W”. The instructor assigning the grade will stipulate in writing at the time the grade is given the conditions under which the “I” may be removed. The assigned work and a change of grade must be recorded within one calendar year from the date of the “I”. Failure to do so results in an “F” for that course.

Please note the following important dates: January 30, Last day for student-initiated drop without a penalty, (drop does not count against drop limit). March 25, Last day for student-initiated drop with a penalty (counts

### Course Outline

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Topic</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 9</td>
<td>Vectors in Plane and in Space</td>
<td>6 hours</td>
</tr>
<tr>
<td>Chapter 10</td>
<td>Vector-Valued Functions</td>
<td>5 hours</td>
</tr>
<tr>
<td>Chapter 11</td>
<td>Partial Differentiation</td>
<td>11 hours</td>
</tr>
<tr>
<td>Chapter 12</td>
<td>Multiple Integration</td>
<td>12 hours</td>
</tr>
<tr>
<td>Chapter 13</td>
<td>Vector Analysis</td>
<td>11 hours</td>
</tr>
</tbody>
</table>