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Math 2450 sec. 021, Calculus III with Applications, Spring 2019
COURSE SYLLABUS

Meeting: TR 9:30am-10:50am Mechanical Engineering South 205
R 11:00am-11:50am Mechanical Engineering South 205

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Instructor: Md Masud Rana
Office: **MATH 117E**
Email: md-masud.rana@ttu.edu
Office Hours: **Tuesday 11:00 am – 1:00 pm, Friday 12:00 pm – 1:00 pm, or by appointment.**

Course Coordinator: Eugenio Aulisa, Professor
Office: MATH 226; Office Phone: (806) 834-6684
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Textbook: K. Smith, M. Strauss and M. Toda, Calculus, 7ᵗʰ National Edition, Kendall Hunt.
Online version of the book can be found at **https://he.kendallhunt.com/product/calculus**

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. 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 text-book 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.

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 on the WebWork system at http://webwork.math.ttu.edu/webwork2/spr19mdranam2450s021. Students will be informed by the instructor and via email (on the @ttu.edu address) about the HW, which should be completed before the given deadline (generally not more than 10 days). Many of the HW problems will be discussed in class at a later time. **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 assess your class performances. The instructor will check regularly your HW score and let you know if you are not on track.

Examinations:

Exam #1: Tue, Feb 12, 9:30am-10:50am	worth 15% of the final grade
Exam #2: Tue, Mar 19, 9:30am-10:50am	worth 20% of the final grade
Exam #3: Tue, Apr 16, 9:30am-10:50am	worth 20% of the final grade
Final Examination: Mon, May 13, 10:30am-1:00pm	worth 30% of the final grade

Grading Policy: A perfect score in all tests and homework results in an overall grade of 105%. If your overall score is less than 60% you will receive an F grade, in between 60-69% you will receive a D grade, in between 70-79% you will receive a C grade, in between 80-89% you will receive a B grade, in between 90-99% you will receive an A grade, with 100% or more you will receive A+ grade.

Attendance and Class Policies. Attendance is mandatory! Students with less/equal than 3 missed classes will receive a bonus of 3 points on the final grade. One the other hand, students with more than 3 missed classes will not receive any bonus point offered in class. 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. If you miss a class, it is your responsibility to find out what you missed.

Classes start and end always on time. Students are not allowed to leave the class before the end of the hour without authorization. During class time it is not allowed to text, chat and sleep. Please put in the silent mode all your electronic devices.

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

Make ups. There are no make ups for the examinations, except for reasons of illness, stated in writing by a medical doctor, observance of a religious holiday or university justified field trips. 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 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: instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information, please contact Student Disability Services in West Hall or call 806-742-2405. https://www.depts.ttu.edu/opmanual/OP34.22.pdf.

Absence for observance of a religious holy day (TTU Operating Policy 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 in writing 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. https://www.depts.ttu.edu/opmanual/OP34.19.pdf.

Academic Integrity (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. http://www.depts.ttu.edu/opmanual/OP34.12.pdf.

Please note the following important dates: **February 1**, last day for student-initiated drop without a penalty, (drop does not count against drop limit). **March 27**, last day for student-initiated drop with a penalty (counts against drop limit). After the deadline, the student must complete the course for a grade. The 2017-2018 official calendar can be found at:
https://www.depts.ttu.edu/officialpublications/calendar/18-19_cal_detailed.php.

Course Outline

Chapter 9 (review 9.1-4, cover 9.5-9.7)	Vectors in Plane and in Space	6 hours
Chapter 10 (10.3, 10.5 are optional)	Vector-Valued Functions	5 hours
Chapter 11	Partial Differentiation	11 hours
Chapter 12 (12.6 is optional)	Multiple Integration	12 hours
Chapter 13	Vector Analysis	11 hours

Math Tutoring & Study Center, MATH 106, Monday - Friday: 9am – 4:00pm, and is closed whenever the University is closed such as on University holidays or when the University closes for inclement weather).

Supplemental Instruction Sessions, 205 Mechanical Engineering South, TR, 4-5:30PM by Sergio Baez.