

## Mathematics 320 Multivariate Calculus

<b>Textbook</b>	Calculus: Early Transcendentals (8th Edition), Loose-Leaf Edition, Stewart. ISBN: 9781305272354 (or bundled with WebAssign: 9781305616691).
<b>Instructor</b>	Dr. John M. Cochran HU 224F e-mail: jcochr15@utm.edu phone: (781) 881-7483
<b>Prerequisite</b>	A grade of C or better in Mathematics 252-Calculus II.
<b>Catalog</b>	Vectors and analytic geometric in space. Vector-valued functions of several variables. Differentials, gradients, and extrema of functions of several variables. Multiple integrals and their applications. Introductory vector analysis including line and surface integrals.
<b>Learning Outcomes for Major</b>	<p>This course addresses one or more of the student learning outcomes for the major. Upon completion of his/her degree from the University of Tennessee at Martin with a major in mathematics, the graduate will be able to:</p> <ol style="list-style-type: none"><li>i. apply mathematical concepts and principles to perform numerical and symbolic computations.</li><li>ii. use technology appropriately to investigate and solve mathematical and statistical problems.</li><li>iii. write clear and precise proofs.</li><li>iv. communicate effectively in both written and oral form.</li><li>v. demonstrate the ability to read and learn mathematics and/or statistics independently.</li></ol>
<b>Objectives</b>	<p>The student will:</p> <ol style="list-style-type: none"><li>1. Understand and use the basic ideas and concepts behind vectors and three-dimensional analytic geometry.</li><li>2. Use the basic calculus of vector-valued functions and apply this to solving problems concerning motion in space.</li><li>3. Understand the concepts of limits and continuity of functions of several variables.</li><li>4. Understand the concept of partial derivatives and work problems using chain rule, directional derivatives, and gradients of multivariate functions.</li><li>5. Apply the calculus of several variables to finding tangents and normals, developing approximations, and locating extrema of functions of several variables.</li><li>6. Set up and evaluate multiple integrals in the rectangular, cylindrical, and spherical coordinate systems.</li><li>7. Apply multiple integration to finding areas, volumes, moments, and other situations.</li><li>8. Understand and employ basic vector analysis techniques including line integrals, Green's Theorem, surface integrals, Divergence Theorem, and Stokes' Theorem.</li></ol>
<b>Technology</b>	You will not be allowed to use a calculator that performs symbolic computations on any of your tests in this course (e.g. TI-89 or TI-92). You may not bring cell phones, laptops, or any other electronic devices to class. This is especially true on exam days.
<b>Quizzes/HW</b>	You will have homework for each section. It is EXTREMELY important to do these problems as they will adequately prepare you for the exams.

- Exams/Final** You will have four exams during the semester. You will also be required to take a comprehensive final exam. The final exam will be in HU416 on Monday, April 29, 7:45 am to 9:45 am. THERE WILL BE NO MAKEUP EXAMS. If a student misses an exam, the student must notify me within two days with a reason. With a valid reason - determined by the instructor - the grade on the final will replace the missing exam grade. After two missed exams, a student will receive zero for any additional exam that is missed.
- Acad. Honesty** Students will conduct themselves with academic integrity and not resort to cheating. Students who cheat will at least fail the class and will be reported to Student Affairs.
- Grading Scale** Partial credit will be given at the instructor's discretion. You may use calculators but keep in mind that the mathematics is more important than numerical answers. Correct answers without mathematical justification will gain no points. Grades will be based upon 600 points (four 100 point exams, one 200 point final) as follows: 600 – 540 - A, 539 – 480 - B, 479 – 420 - C, 419 – 360 - D,  $\leq$  359 - F.
- Course Outline** The tentative schedule is as follows.  
 Week 1: 12.1  
 Week 2: 12.2-12.5  
 Week 3: 12.6, 13.1-13.3  
 Week 4: 13.3-13.4, Exam 1 (Friday)  
 Week 5: 14.1-14.3  
 Week 6: 14.3-14.6  
 Week 7: 14.6-14.8  
 Week 8: 14.8-15.1, Exam 2 (Wednesday), 15.1 (Spring Break)  
 Week 9: 15.2-15.3  
 Week 10: 15.4-15.6  
 Week 11: 15.6-15.9  
 Week 12: 16.1, Exam 3 (Tuesday), 16.2  
 Week 13: 16.3-16.4  
 Week 14: 16.5-16.7, (Good Friday)  
 Week 15: 16.8-16.9, Exam 4 (Friday)
- Disabilities** Any student eligible for and requesting reasonable accommodations due to a disability is required to provide a letter of accommodation from the Student Success Center within the first two weeks of the semester.

*The instructor reserves the right to change the syllabus as necessary to meet the class objectives.*