

MATH 2415 STEM
Calculus II

Western Texas College

- I. Basic Course Information
 - A. MATH 2415 Course Description: Advanced topics in calculus, including vectors and vector-valued functions, partial differentiation, Lagrange multipliers, multiple integrals, and Jacobians; application of the line integral, including Green's Theorem, the Divergence Theorem, and Stokes' Theorem.
 - B. Any required prerequisites: Students must make a C or better in MATH 2414.
 - C. Advancement Via Individual Determination (AVID) learning strategies will be implemented periodically throughout the course.
 - D. This course has been designed to prepare students whose chosen field of study requires a STEM mathematical pathway.
 - E. Project Base Learning (PBL) is an active learning method in which students gain knowledge and skill by investigating and responding to a tangible, engaging and complex question, problem or challenge.
 - F. Online course content is administered through the college's learning management system (LMS), Moodle, also called eCampus. A link to eCampus can be found on mywtc.edu and to Moodle (the big M with a graduation cap) on the college's home page, www.wtc.edu.
- II. Student Learning Outcomes
 - A. Perform calculus operations on vector-valued functions, including derivatives, integrals, curvature, displacement, velocity, acceleration, and torsion.
 - B. Perform calculus operations on functions of several variables, including partial derivatives, directional derivatives, and multiple integrals.
 - C. Find extrema and tangent planes.
 - D. Solve problems using the Fundamental Theorem of Line Integrals, Green's Theorem, the Divergence Theorem, and Stokes' Theorem.
 - E. Apply the computational and conceptual principles of calculus to the solutions of real-world problems.
- III. Course Requirements
 - A. Major Requirements—All major requirements must be proctored.
 - 1. In-Class Participation
 - 2. Unit Exams
 - 3. Midterm Exam
 - 4. Final Exam
 - B. Minor Requirements
 - 1. Binder Checks
 - 2. Homework
 - 3. Quizzes

4. Projects
- IV. Testing Requirements
- A. Students are NOT allowed to use their book or notes of any kind while completing major requirements.
- V. Information on Books and Other Course Materials
- A. Required Book: Calculus (Early Transcendentals) 2nd Edition by William Briggs and Lyle Cochran. Book ISBN: 9780321954428
- B. Required Access Code: Online Students must purchase a MyMathLab Access Code. This code can be purchased stand alone or bundled with the textbook. MyMathLab stand alone (provides e-book) ISBN: 0321653998. A la carte version w/MML ISBN: 9780321965165.
- C. Calculators: A TI-84 or higher is strongly recommended. The TI-89, TI-Inspire with CAS or any other calculator with CAS capability are not permitted.
- VI. Other Policies, Procedures and important dates. Please refer to the WTC [Catalog](#) for the following:
- A. Campus Calendar
- B. Final exam schedule
- C. How to drop a class.
- D. Withdrawal information
- E. Student Conduct/Academic Integrity
- F. Class Attendance
- G. Students with disabilities
- VII. Planned Course of Study

Chapters and Sections to be covered throughout the semester		
Chapter 11— Parametric and Polar Curves	11.1	Vectors in the Plane
	11.2	Vectors in Three Dimensions
	11.3	Dot Products
	11.4	Cross Products
	11.5	Lines and Curves in Space
	11.6	Calculus of Vector-Valued Functions
	11.7	Motion in Space
	11.8	Length of Curves
	11.9	Curvature and Normal Vectors
Chapter 12— Vectors and Vector-Valued Functions	12.1	Planes and Surfaces
	12.2	Graphs and Level Curves
	12.3	Limits and Continuity
	12.4	Partial Derivatives
	12.5	The Chain Rule
	12.6	Directional Derivatives and the Gradient
	12.7	Tangent Planes and Linear Approximation
	12.8	Maximum and Minimum Problems
	12.9	Lagrange Multiplier

Chapter 13— Functions of Several Variables	13.1	Double Integrals over Rectangular Regions
	13.2	Double Integrals over General Regions
	13.3	Double Integrals in Polar Coordinates
	13.4	Triple Integrals
	13.5	Triple Integrals in Cylindrical and Spherical Coordinates
	13.6	Integrals for Mass Calculations
	13.7	Change of Variables in Multiple Integrals
Chapter 14— Multiple Integration	14.1	Vector Fields
	14.2	Line Integrals
	14.3	Conservative Fields
	14.4	Green's Theorem
	14.5	Divergence and Curl
	14.6	Surface Integrals
	14.7	Stokes' Theorem
	14.8	Divergence Theorem

*This schedule is subject to change at the discretion of the instructor.

Last Modified: August 23, 2019