

**MATH 2413 STEM
Calculus I**

Western Texas College

- I. Basic Course Information
 - A. MATH 2413 Course Description: Limits and continuity; the Fundamental Theorem of Calculus; definition of the derivative of a function and techniques of differentiation; applications of the derivative to maximizing or minimizing a function; the chain rule, mean value theorem, and rate of change problems; curve sketching; definite and indefinite integration of algebraic, trigonometric, and transcendental functions, with an application to calculation of areas.
 - B. Any required prerequisites: Students must make a C or better in MATH 1316 or have the appropriate entrance exam score.
 - C. Required Grade for Enrolling in the Next Course in this Sequence: A grade of C in this course is required to advance to MATH 2414.
 - D. Advancement Via Individual Determination (AVID) learning strategies will be implemented periodically throughout the course.
 - E. This course has been designed to prepare students whose chosen field of study requires a STEM mathematical pathway.
 - F. 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.
 - G. 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. Develop solutions for tangent and area problems using the concepts of limits, derivatives, and integrals.
 - B. Draw graphs of algebraic and transcendental functions considering limits, continuity, and differentiability at a point.
 - C. Determine whether a function is continuous and/or differentiable at a point using limits.
 - D. Use differentiation rules to differentiate algebraic and transcendental functions.
 - E. Identify appropriate calculus concepts and techniques to provide mathematical models of real-world situations and determine solutions to applied problems.
 - F. Evaluate definite integrals using the Fundamental Theorem of Calculus.
 - G. Articulate the relationship between derivatives and integrals using the Fundamental Theorem of Calculus.
- 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 2— Limits	2.1 The idea of Limits 2.2 Definitions of Limits 2.3 Techniques for Computing Limits 2.4 Infinite Limits 2.5 Limits at Infinity 2.6 Continuity
Chapter 3— Derivatives	3.1 Introducing the Derivative 3.2 Working with Derivatives 3.3 Rules of Differentiation 3.4 The Product and Quotient Rules

	3.5 Derivatives of Trig Functions 3.6 Derivatives as Rates of Change 3.7 The Chain Rule 3.8 Implicit Differentiation 3.9 Derivatives of Logarithmic and Exponential Functions 3.10 Derivatives of Inverse Trigonometric Functions 3.11 Related Rates
Chapter 4— Applications of the Derivative	4.1 Maxima and Minima 4.2 What Derivatives Tell Us 4.3 Graphing Functions 4.4 Optimization Problems 4.5 Linear Approximation and Differentials 4.6 Mean Value Theorem 4.7 L'Hopital's Rule 4.9 Antiderivatives
Chapter 5— Integration	5.1 Approximating Areas under Curves 5.2 Definite Integrals 5.3 Fundamental Theorem of Calculus 5.4 Working with Integrals 5.5 Substitution Rule

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

Last Modified: August 23, 2019