MATH 2313 Calculus I

Credit: 3 semester credit hours (3 hours lecture)

Prerequisite/Co-requisite: Passed MATH 2312 Pre-Calculus with a "C" or better.

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.

Required Textbook and Materials
- MyMathLab Standalone Access Code
   a. May be purchased online at **www.mymathlab.com**
   b. May be purchased at a local bookstore: **ISBN 032119991X**

Learning Outcomes

Upon successful completion of this course, the student will be able to:
1. Develop solutions for tangent and area problems using the concepts of limits, derivatives, and integrals.
2. Draw graphs of algebraic and transcendental functions considering limits, continuity, and differentiability at a point.
3. Determine whether a function is continuous and/or differentiable at a point using limits.
4. Use differentiation rules to differentiate algebraic and transcendental functions.
5. Identify appropriate calculus concepts and techniques to provide mathematical models of real-world situations and determine solutions to applied problems.
6. Evaluate definite integrals using the Fundamental Theorem of Calculus.
7. Articulate the relationship between derivatives and integrals using the Fundamental Theorem of Calculus.

Course Outline
A. Chapter 1: Functions
   1. Review of Functions
   2. Representing Functions
   3. Inverse, Trigonometric, Exponential, and Logarithmic Functions
B. Chapter 2: Limits
   1. The Idea of Limits
   2. Definitions of Limits
   3. Techniques for Computing Limits
   4. Infinite Limits

     5. Limits at Infinity
     6. Continuity
C. Chapter 3: Derivatives
     1. Introducing the Derivative
     2. Working with Derivatives
     3. Rules of Differentiation
     4. The Product and Quotient Rules
     5. Derivatives of Trigonometric Functions
     6. Derivatives as Rates of Change
     7. The Chain Rule
     8. Implicit Differentiation
     9. Related Rates
D. Chapter 4: Applications of the Derivative
     1. Maxima and Minima
     2. What Derivatives Tell Us
     3. Graphing Functions
     4. Optimization Problems
     5. Linear Approximation and Differentials
     6. Mean Value Theorem
     7. L'Hôpital's Rule
     8. Antiderivatives
E. Chapter 5: Integration
     1. Approximating Areas under Curves
     2. Definite Integrals
     3. Fundamental Theorem of Calculus
     4. Working with Integrals
     5. Substitution Rule

Grade Scale

90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
0 – 59	F

Course Evaluation

Final grades will be calculated according to the following criteria:

Tests	60%
Comprehensive Final Exam	10%
Course Assignments (including Core Assignment)	20%
Participation	10%

Course Requirements

1. Attendance is mandatory.
2. The student must purchase all of the required course materials.
3. The student will be expected to have access to the Internet and a computer.

4. Additional course requirements as defined by the individual course instructor.

Course Policies

1. Cheating of any kind will <u>not</u> be tolerated.
2. The students are responsible for initiating and completing the drop process. Students who stop coming to class and fail to drop the course will earn an "F" in the course.
3. Additional class policies as defined by the individual course instructor.

Technical Requirements (for courses using Blackboard)

The latest technical requirements, including hardware, compatible browsers, operating systems, software, Java, etc. can be found online at:
https://help.blackboard.com/en-us/Learn/9.1_2014_04/Student/015_Browser_Support/015_Browser_Support_Policy A functional broadband internet connection, such as DSL, cable, or WiFi is necessary to maximize the use of the online technology and resources.

Disabilities Statement

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building. You may also visit the online resource at http://www.lit.edu/depts/stuserv/special/defaults.aspx

Student Code of Conduct Statement

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at www.lit.edu or obtained in print upon request at the Student Services Office. Please note that the online version of the *LIT Catalog and Student Handbook* supersedes all other versions of the same document.

Starfish

LIT utilizes an early alert system called Starfish. Throughout the semester, you may receive emails from Starfish regarding your course grades, attendance, or academic performance. Faculty members record student attendance, raise flags and kudos to express concern or give praise, and you can make an appointment with faculty and staff all through the Starfish home page. You can also login to Blackboard or MyLIT and click on the Starfish link to view academic alerts and detailed information. It is the responsibility of the student to pay attention to these emails and information in Starfish and consider taking the recommended actions. Starfish is used to help you be a successful student at LIT.