



## **MATH 2312 Pre-Calculus**

**Credit:** 3 semester credit hours (3 hours lecture)

**Prerequisites:** Passed MATH 1314 College Algebra with a “C” or better.

### **Course Description:**

This course is an in-depth combined study of algebra, trigonometry, and other topics necessary for Calculus readiness.

### **Required Textbook and Materials:**

1. MyMathLab Standalone Access Code
  - a. May be purchased online at [www.mymathlab.com](http://www.mymathlab.com)
  - b. Or may be purchased at a local bookstore: ISBN 032119991X
2. A basic scientific calculator. Check with your instructor as to the specific type of calculator required.

### **Course Objectives**

Upon successful completion of this course, students will:

1. Demonstrate and apply knowledge of the properties of functions.
2. Recognize and apply algebraic and transcendental functions and solve related equations.
3. Apply graphing techniques to algebraic and transcendental functions.
4. Compute the values of trigonometric functions for key angles in all quadrants of the unit circle measured in both degrees and radians.
5. Prove trigonometric identities.
6. Solve right and oblique triangles.

### **Course Outline**

- A. Chapter 1: Review of Graphs and Functions
  1. Solving and graphing linear equations. Distance and Midpoints.
  2. Function notation and domains of functions.
  3. Linear functions and slope. Applications of slope.
  4. Equations of lines. Parallel and Perpendicular lines.
  5. Application of linear models.
- B. Chapter 2: More on Functions
  1. Increasing, decreasing, and constant functions.
  2. Relative maximum and minimum values.
  3. Functions defined piecewise.
  4. The algebra of functions.
  5. Composition and transformations of functions.
  6. Symmetry. Even and odd functions.
- C. Chapter 3: Quadratic Functions and Equations
  1. The Complex numbers. Conjugates and division.

2. Solving quadratic equations using completing-the-square and the quadratic formula.
  3. Quadratic formula and the discriminant.
  4. Analyzing graphs of quadratic functions.
  5. Solving rational equations, solving radical equations, solving absolute value equations.
- D. Chapter 4: Polynomial Functions and Rational Functions
1. Finding zeroes of polynomial functions.
  2. Polynomial division. The remainder theorem and synthetic division.
  3. Graphing polynomial functions.
  4. The domain of a rational function and asymptotes.
- E. Chapter 5: Exponential and Logarithmic Functions
1. Inverse functions.
  2. Graphing exponential functions and the number  $e$ .
  3. Converting between exponential equations and logarithmic equations.
  4. Graphing logarithmic functions.
  5. Changing logarithmic bases.
  6. Natural logarithms.
  7. Properties of logarithmic functions.
  8. Solving exponential and logarithmic equations.
  9. Applications and models: growth and decay and compound interest.
- F. Chapter 6: The Trigonometric Functions
1. The trigonometric ratios and the graphs of the trigonometric functions.
  2. Solving right triangles with applications.
  3. Arc length and central angle.
  4. Radian measure.
  5. Graphs and properties of circular functions.
  6. Graphs of transformed sine and cosine functions.
- G. Chapter 7: Trigonometric Identities and Inverse Functions
1. Pythagorean identities.
  2. Double-angle and half-angle identities.
  3. Proving trigonometric identities.
  4. Inverse of trigonometric functions.
  5. Solving trigonometric equations.
- H. Chapter 8: Applications of Trigonometry
1. The law of sines and the law of cosines.
  2. Solving triangles using AAS, ASA, SSA, SAS, and SSS.
  3. Solving oblique triangles.
  4. Polar coordinates and graphing polar equations.

### **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	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 not be tolerated.
2. Telephones, headphones, and other electronic devices must be turned off while in class.
3. Students are responsible for initiating and completing the drop process. Students who do not attend class and fail to drop the course will earn an “F” in the course.
4. 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](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](http://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.

