

COLLEGE ALGEBRA AND TRIGONOMETRY

The University of Toledo
Mathematics & Statistics Department, College of Natural Sciences and Mathematics
MATH1340-0XX, CRN XXXXX

Instructor:	(Insert Name]	Class Location:	(Insert Building/Room)
Email:	(Insert E-mail Address)	Class Day/Time:	(Insert Days/Time)
Office Hours:	(Insert Days/Time)	Lab Location:	(Insert Building/Office #, if applicable)
Office Location:	(Insert Building/Office Number)	Lab Day/Time:	(Insert Days/Time, if applicable)
Office Phone:	(Insert Phone Number)	Credit Hours:	5
Term:	(Insert Semester and Year)		

COURSE DESCRIPTION

Functions and graphs, exponential and logarithmic functions, trigonometric functions and applications, systems of equations and topics in analytic geometry.

STUDENT LEARNING OUTCOMES

Math 1340 focuses on the concept of a function and the solution of equations. Students will demonstrate skills verbally, numerically, graphically and algebraically. A more detailed list of learning objectives is given below. At least 70% of the course time will be devoted to these essential outcomes. These objectives are listed again in the chronological list of topics at the end of this syllabus.

- **Representation:** Graphical, algebraic, numerical, and verbal representation of linear, quadratic, polynomial, rational, root/radical/power, exponential, logarithmic, trigonometric, and piecewise-defined functions.
- **Graphs:** Determine whether an algebraic or trigonometric relation or given graph represents a function; perform transformations on graphs and operations with functions; determine intercepts, domain, range, intervals of monotonicity, vertex of a quadratic, asymptotes, symmetry; and match graphs to algebraic or trigonometric definitions.
- **Remainder and Factor Theorems:** Use the Remainder and Factor Theorems for polynomial functions.
- **Inverse functions:** Describe the relationship of the graph of a function to that of its inverse; determine the algebraic form of inverse functions.
- **Trigonometric Definitions:** Define the six trigonometric functions in terms of right triangles and the unit circle.
- **Modeling:** Use functions to model a variety of real-world problem-solving applications.
- **Angles/Triangles:** Solve right and oblique triangles in degrees and radians for both special and non-special angles, and solve application problems that involve right and oblique triangles.
- **Equations:** Recognize the difference between an algebraic equation and function; describe the relationship among the solutions of an equation and the zeros of the corresponding function; identify the coordinates of the x-intercepts of the graph of a function.
- **Solutions of equations and inequalities:** Solve a variety of equations, including polynomial, rational, exponential, and logarithmic, including equations arising in applications; solve a system of linear equations graphically and algebraically by substitution and elimination; and solve polynomial and rational inequalities graphically and algebraically.
- **Conic Sections:** Identify and express the conics (quadratic equations in two variables) in standard rectangular form, graph the conics, and solve applied problems involving conics.
- **Trigonometric Identities:** Verify trigonometric identities by algebraically manipulating trigonometric expressions using fundamental trigonometric identities, including the Pythagorean, sum and difference of angles, double-angle and half-angle identities.
- **Sequences and Series:** Represent sequences verbally, numerically, graphically and algebraically. Write series in summation notation, and represent sequences of partial sums

verbally, numerically and graphically. Identify and express the general term of arithmetic and geometric sequences, and find the sum of arithmetic and geometric series.

- **Vectors:** Represent vectors graphically in both rectangular and polar coordinates and understand the conceptual and notational difference between a vector and a point in the plane. Perform basic vector operations both graphically and algebraically – addition, subtraction and scalar multiplication. Solve application problems using vectors.

PREREQUISITES

Sufficient score on the math placement exam.

REQUIRED MATERIALS

- ALEKS 360 access card for PreCalc. Online access is provided with an e-text and may be purchased from www.ALEKS.com (you need a credit card) or the bookstore. The course is based on: Precalculus, Miller 1st edition ISBN: 1259723321. You will receive details the first day of the class.
- Access to a PC or Mac connected to the web and on which you have privileges to install browser plug-ins. (for ALEKS, above)

CALCULATOR: You will need to own or have access to a scientific calculator that has the trigonometric function keys. A graphing calculator is helpful, but not required. Cell phones, smart phones, and graphing calculators are not allowed during quizzes and exams.

UNIVERSITY POLICIES:

POLICY STATEMENT ON NON-DISCRIMINATION ON THE BASIS OF DISABILITY (ADA)

The University is an equal opportunity educational institution. Please read The University's Policy Statement on Nondiscrimination on the Basis of Disability Americans with Disability Act Compliance.

ACADEMIC ACCOMMODATIONS

The University of Toledo is committed to providing equal access to education for all students. If you have a documented disability or you believe you have a disability and would like information regarding academic accommodations/adjustments in this course please contact the Student Disability Services Office (Rocket Hall 1820; 419.530.4981; studentdisabilitysvs@utoledo.edu) as soon as possible for more information and/or to initiate the process for accessing academic accommodations. For the full policy see: <http://www.utoledo.edu/offices/student-disability-services/sam/index.html>

ACADEMIC POLICIES:

STUDENT PRIVACY

Federal law and university policy prohibits instructors from discussing a student's grades or class performance with anyone outside of university faculty/staff without the student's written and signed consent. This includes parents and spouses. For details, see the “Confidentiality of student records (FERPA)” section of the University Policy Page at <http://www.utoledo.edu/policies/academic/undergraduate/index.html>

MISSED CLASS POLICY

If you miss any graded item, then this item may only be made up in accordance with the University's Missed Class Policy. This policy requires that you contact me in advance by phone, e-mail or in

person, provide official documentation for the absence, and make up the missed item as soon as possible. You can find the University's Missed Class Policy at <http://www.utoledo.edu/policies/academic/undergraduate/index.html>

ACADEMIC DISHONESTY

Any act of academic dishonesty as defined by the University of Toledo policy on academic dishonesty (found at <http://www.utoledo.edu/dl/students/dishonesty.html>) will result in an F in the course or an F on the item in question, subject to the determination of the instructor.

GRADING:

EVALUATION

The evaluation for this course will be based upon a percentage of the total of homework, test and final exam scores:

1. Quizzes and homework (Insert min percent) to (Insert max percent)%
2. Midterms (Insert min percent) to (Insert max percent)%
3. Final Exam (comprehensive) (Insert min percent) to (Insert max percent)%
4. Total 100%

Grades are based on the following percentages of total points:

100% - 90% A

89% - 80% B

79% - 70% C

69% - 60% D

Below 60% F

Pluses and minuses will be used using the policy of the University.

ASSESSMENT OF STUDENT LEARNING

Assessment will be based on a combination of homework, quizzes, midterms and a final exam. You will need to demonstrate the ability to apply mathematical reasoning and skills to solve problems in all the outcome areas listed above using correct mathematical notation.

RESPONSIBILITIES OF THE STUDENT

You are expected to attend each class session. If you attend class, it is assumed that you will participate actively by asking questions and participating in discussions. You are expected to prepare for class, to have read the indicated sections prior to the class session and have your homework completed by the indicated date. This is a three credit hour course and you should expect to spend 5 to 8 hours outside of class reading, studying and doing homework problems. The syllabus schedule indicates the order in which the sections will be discussed. If you must miss a class, it is your responsibility to find out what you missed including any announcements which were made.

IMPORTANT DATES

*The instructor reserves the right to change the content of the course material if he perceives a need due to postponement of class caused by inclement weather, instructor illness, etc., or due to the pace of the course.

MIDTERM EXAM:

FINAL EXAM:

OTHER DATES

The last day to drop this course is: _____

The last day to withdraw with a grade of “W” from this course is: _____

STUDENT SUPPORT SERVICES

Free math tutoring on a walk-in basis is available in the **Math Learning and Resources Center** located in Rm B0200 in the lower level of Carlson Library (phone ext 2176). The Center operates on a walk-in basis. MLRC hours can be found at <http://www.math.utoledo.edu/mlrc/MLRC.pdf>

TOPICS TO BE COVERED:

Topic	Book Section	Learning Objective	Hours
Solving Systems of Linear Equations - Graphically	7.1	Solving Systems of Linear Equations	0.5
Solving Systems of Linear Equations - Elimination Method	7.2	Solving Systems of Linear Equations	0.5
Solving Systems of Linear Equations - Substitution Method	7.1	Solving Systems of Linear Equations	0.5
Solving Systems of Linear Equations - Modeling Problems	7.1, 7.2	Solving Systems of Linear Equations, Modeling	1
Conics – Parabolas	10.2	Conic Sections	1
Conics – Ellipses	10.3	Conic Sections	1
Conics – Hyperbolas	10.4	Conic Sections	1
Conics - Modeling Problems	10.2, 10.3, 10.4	Conic Sections, Modeling	1.5
Relationships and Functions	1.4, 1.5, 1.6	Graphs, Equations	1
Transformations of Functions - Stretching and Shrinking	1.7	Functions, Graphs	1
Transformations of Functions - Translations	1.7	Functions, Graphs	1
Transformations of Functions – Reflections	1.7	Functions, Graphs	1
Operations with Functions - Addition and Subtraction	1.8	Functions	1
Operations with Functions - Multiplication and Division	1.8	Functions	1
Operations with Functions - Composition	1.8	Functions	1
Quadratic Functions - Finding the Vertex	2.1	Functions, Graphs	0.5
Quadratic Functions - x - and y -intercepts	2.1	Functions, Graphs	0.5
Quadratic Functions - The Quadratic Formula	A48, 2.4	Solutions of Equations	1
Quadratic Functions - Modeling with Quadratic Functions	2.1	Modeling	1
Polynomial Functions - Graphs of Polynomials	2.2	Graphs	2
Polynomial Functions - The Remainder Theorem	2.3	Remainder Theorem	1
Polynomial Functions - The Factor Theorem	2.3	Factor Theorem	1
Polynomial Functions - Zeros of Polynomials	2.5	Solutions of Equations	1
Rational Functions	2.6	Graphs	2
Modeling with Polynomial and Rational Functions	2.2, 2.6	Modeling	1
Solving Nonlinear Inequalities - Graphically	2.7	Solving Inequalities	1
Solving Nonlinear Inequalities - Algebraically	2.7	Graphing, Solving Inequalities	1

Inverse Functions	1.9	Inverse Functions	1
Exponential Functions	3.1, 3.4	Graphs, Functions	2
Logarithmic Functions	3.2, 3.3, 3.4	Graphs, Functions	2
Modeling with Exponential and Logarithmic Functions	3.5	Modeling	1
Sequences	9.1, 9.2, 9.3	Sequences	1
Series	9.1	Series	1
Arithmetic Series	9.2	Series	1
Geometric Series	9.3	Series	1
Total Hours for College Algebra:			37
Radian and Degree Measure	4.1	Angles	1
The Six Trigonometric Functions in Terms of a Right Triangle	4.3	Triangles, Modeling	1.5
Applications Involving Right Triangles	4.8	Modeling	1.5
Definition of the Six Trigonometric Functions Using the Unit Circle	4.2	Definitions	1.5
Reference Angles	4.4	Definitions	1.5
Coterminal Angles	4.1, 4.2	Definitions	1.5
The Graphs of the Trigonometric Functions	4.5, 4.6	Graphs	3
The Inverse Trigonometric Functions	4.7	Definitions, Modeling	3
The Graphs of the Inverse Trigonometric Functions	4.7	Graphs	2
Fundamental Trigonometric Identities	5.1, 5.2	Identities	2
Pythagorean Identities	5.1, 5.2	Identities	2
Solving Trigonometric Equations	5.3	Equations, Modeling	2
Sum and Difference Formulas	5.4	Identities	1.5
Double-Angle Formulas	5.5	Identities	1.5
Half-Angle Formulas	5.5	Identities	1.5
The Law of Sines	6.1	Identities, Modeling	1.5
The Law of Cosines	6.2	Identities, Modeling	1.5
Vectors	6.3	Vectors, Modeling	3
Total Hours for Trigonometry:			33

4-5 hours (depending on holidays) for review, quizzes, and midterms