MATH 119 Precalculus Trigonometry

1. Catalog Description

MATH 119. Precalculus Trigonometry 4 units
GE Area B1

Prerequisite: Completion of ELM requirement and passing score on appropriate Mathematics Placement Examination, or MATH 117, or MATH 118. Rectangular and polar coordinates. Trigonometric functions, fundamental identities. Inverse trigonometric functions and relations. Vectors, complex numbers, conic sections, and analytic geometry. Not open to students with credit in MATH 141, MATH 161, or MATH 221. 4 lectures. Fulfills GE B1; for students admitted Fall 2016 or later, a grade of C- or better in one GE B1 course is required to fulfill GE Area B.

2. Required Background or Experience

Math 118 or equivalent.

3. Learning Objectives

The student should:

a. Understand the trigonometric functions as developed from both a right triangle and a circle.
b. Apply trigonometric functions to simple problems involving the geometry of triangles and circles, vectors, and periodic phenomena.
c. Derive basic trigonometric identities and use them to manipulate expressions involving trigonometric functions.
d. Graph with facility equations similar to $y = A \sin(Bx + C)$ and combinations thereof.
e. Understand and be able to manipulate the inverse trigonometric functions and use them to solve trigonometric equations.
f. Understand analytic geometry and the polar form of the conic sections.

4. Text and References


5. Minimum Student Materials

Paper, pencils, and notebook.
6. **Minimum University Facilities**

Classroom with ample chalkboard space for demonstration and class use.

7. **Content and Method**

**Topic Lectures**

**Chapter 2: Functions (Review) 2**
- 2.7: Combining Functions
- 2.8: One-to-One Functions and Their Inverses

**Chapter 5: Trigonometric Functions: Unit Circle Approach 8**
- 5.1: The Unit Circle
- 5.2: Trigonometric Functions of Real Numbers
- 5.3: Trigonometric Graphs
- 5.4: More Trigonometric Graphs
- 5.5: Inverse Trigonometric Functions and Their Graphs
- 5.6: Modeling Harmonic Motion
- 5: Focus on Modeling

**Chapter 6: Trigonometric Functions: Right Triangle Approach 4**
- 6.1: Angle Measure
- 6.5: The Law of Sines
- 6.6: The Law of Cosines
- 6: Focus on Modeling

**Chapter 7: Analytic Trigonometry 7**
- 7.1: Trigonometric Identities
- 7.2: Addition and Subtraction Formulas
- 7.3: Double-Angle, Half-Angle, and Product-Sum Formulas
- 7.4: Basic Trigonometric Equations
- 7: Focus on Modeling

**Chapter 8: Polar Coordinates and Parametric Equations 7**
- 8.1: Polar Coordinates
- 8.2: Graphs of Polar Equations
- 8.3: Polar Form of Complex Numbers; De Moivre's Theorem
- 8.4: Plane Curves and Parametric Equations
- 8: Focus on Modeling

**Chapter 11: Conic Sections 6**
- 11.1: Parabolas
- 11.2: Ellipses
- 11.3: Hyperbolas
- 11.4: Shifted Conics
8. **Methods of Assessment**

The primary methods of assessment are: essay examinations, quizzes and homework. Typically, there will be one or more hour-long examinations during the quarter, and a required comprehensive final examination.