Tennessee Technological University
Mathematics Department

MATH 1720: Precalculus Trigonometry

I. **COURSE DESCRIPTION FROM CATALOG:**
Circular functions and radian measure, graphs of the trigonometric functions, trigonometric identities and equations, the inverse trigonometric functions, polar coordinates. Applications involving triangles, vectors in the plane, and complex numbers. Lec. 3. Cr. 3.

II. **PREREQUISITE(S):**
ACT mathematics score of 22 or higher or a minimum grade of C in MATH 1000, or a C or better in MATH 1710, or equivalent.

III. **COURSE OBJECTIVES(S):**
Refine the algebraic, geometric, trigonometric and reading comprehension skills necessary in the study of calculus.

The goal of the general education mathematics requirement is to enhance students' abilities to utilize mathematics. Students will demonstrate
1. the ability to use mathematics to solve problems.
2. the ability to create or analyze graphs (or other mathematical representations of data/relationships).
3. proficiency in mathematical computations/algorithms.
4. understanding of mathematical concepts.

IV. **STUDENT LEARNING OUTCOMES:**
Upon successful completion of this course the students will be able to determine exact and/or approximate trigonometric and inverse trigonometric values; manipulate and prove trigonometric identities; create graphs of trigonometric functions incorporating transformations; and solve equations involving trigonometric functions.

V. **TOPICS TO BE COVERED:**

Chapter 5 **Trigonometric Functions**
5.1 Angles and Their Measure
5.2 Trigonometric Functions: Unit Circle Approach
5.3 Properties of Trigonometric Functions
5.4 Graphs of Sine and Cosine Functions
5.5 Graphs of the Tangent, Cotangent, Cosecant, and the Secant Functions
5.6 Phase Shift; Sinusoidal Curve Fitting

Chapter 6 **Analytic Trigonometry**
6.1 Inverse Sine, Cosine, and Tangent Functions
6.2 Inverse Trigonometric Functions
6.3 Trigonometric Equations
6.4 Trigonometric Identities

6.5 Sum and Difference Formulas
6.6 Double and Half Angle Formulas
6.7 Product-to-Sum and Sum-to-Product Formulas

Chapter 7 **Applications of Trigonometric Functions**
7.1 Right Triangle Trigonometry
7.2 Law of Sines
7.3 Law of Cosines
7.4 Area of a Triangle
7.5 Simple Harmonic Motion; Damped Motion; Combining Waves

Chapter 8 **Polar Coordinates; Vectors**
8.1 Polar Coordinates
8.2 Polar Equations and Graphs
8.3 The Complex Plane; De Moivre's Theorem

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| 8.4 Vectors | 8.6 Vectors in Space |
| 8.5 The Dot Product | 8.7 The Cross Product |

VI.   ADDITIONAL INFORMATION:

VII.   POSSIBLE TEXTS AND REFERENCES:
Precalculus: Concepts Through Functions: A Unit Circle Approach, 4th edition
Sullivan and Sullivan

VIII.   ANY TECHNOLOGY THAT MAY BE USED:
Scientific Calculator
My Lab Math

IX.   STUDENT ACADEMIC MISCONDUCT POLICY:
Maintaining high standards of academic integrity in every class at Tennessee Tech is critical to the reputation of Tennessee Tech, its students, alumni, and the employers of Tennessee Tech graduates. The Student Academic Misconduct Policy describes the definitions of academic misconduct and policies and procedures for addressing Academic Misconduct at Tennessee Tech. For details, view the Tennessee Tech's Policy 217 – Student Academic Misconduct at Policy Central.

X.   DISABILITY ACCOMMODATION:
Students with a disability requiring accommodations should contact the Accessible Education Center (AEC). An Accommodation Request (AR) should be completed as soon as possible, preferably by the end of the first week of the course. The AEC is located in the Roaden University Center, Room 112; phone 931-372-6119. For details, view the Tennessee Tech's Policy 340 – Services for Students with Disabilities at Policy Central.