Tennessee Technological University
Mathematics Department

MATH 1730: Precalculus Mathematics

I. COURSE DESCRIPTION FROM CATALOG:

Review of algebra and trigonometry; relations and functions and their graphs, including polynomial and rational functions; conic sections; inequalities, polar coordinates, complex numbers; advanced topics in algebra. Lec. 5. Cr. 5.

II. PREREQUISITE(S):

A minimum ACT Math sub-score of 25 or SAT Math sub-score of 570 or COMPASS College Algebra score of 51, OR a minimum grade of C in MATH 1000.

III. COURSE OBJECTIVE(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 student will manipulate both numeric and algebraic expressions; solve various types of algebraic equations and inequalities; distinguish between relations and functions and create graphs by hand of a variety of functions; compute the solution to a system of equations both graphically and algebraically, and interpret the corresponding result; 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 1: Fundamentals

1.5 Equations
1.6 Complex Numbers
1.10 Lines

Chapter 2: Functions

2.1 Functions
2.2 Graphs of Functions
2.3 Getting Information from the Graph of a Function
2.4 Average Rate of Change of a Function
2.5 Linear Functions and Models
2.6 Transformations of Functions
2.7 Combining Functions
2.8 One-to-One Functions and Their Inverses

Chapter 3: Polynomial and Rational Functions

- 3.1 Quadratic Functions and Models
- 3.2 Polynomial Functions and Their Graphs
- 3.3 Dividing Polynomials
- 3.4 Real Zeroes of Polynomials
- 3.5 Complex Zeros and the Fundamental Theorem of Algebra
- 3.6 Rational Functions
- 3.7 Polynomial and Rational Inequalities

Chapter 4: Exponential and Logarithmic Functions

- 4.1 Exponential Functions
- 4.2 The Natural Exponential Functions
- 4.3 Logarithmic Functions
- 4.4 Laws of Logarithms
- 4.5 Exponential and Logarithmic Equations
- 4.6 Modeling with Exponential Functions

Chapter 5: Trigonometric Functions: Unit Circle Approach

- 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

Chapter 6: Trigonometric Functions: Right Triangle Approach

- 6.1 Angle Measure
- 6.2 Trigonometry of Right Triangles
- 6.3 Trigonometric Functions of Angles
- 6.4 Inverse Trigonometric Functions and Right Triangles

Chapter 7: Analytic Trigonometry

- 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
- 7.5 More Trigonometric Equations

As Time Permits:

- 6.5 The Law of Sines
- 6.6 The Laws of Cosines
- 12.5 Mathematical Induction
- 12.6 The Binomial Theorem
- 13.1 Finding Limits Numerically and Graphically
- 13.2 Finding Limits Algebraically

VI. ADDITIONAL INFORMATION:

VII. POSSIBLE TEXTS AND REFERENCES:

Precalculus: Mathematics for Calculus, 7th edition James Stewart, Lothar Redlin, Saleem Watson. Brooks/Cole (2014)

VIII. ANY TECHNOLOGY THAT MAY BE USED:

WebAssign
Scientific Calculator

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.