

Course Code: MTH 402

Course Description: This is the second of two Web-enabled courses designed to provide students with the necessary preparation for studying calculus and other college mathematics courses. This course begins by reviewing basic concepts in trigonometry. As students continue with the course, they will learn about approximate values, trigonometric identities, graphs, and equations, logarithms, vectors, complex numbers, and polar coordinates. Throughout the course, students will discover examples of the role of mathematics in daily life.

Course Outline:

Unit 1-- Introductory Concepts

Lesson 1 -- Sets, Lines, and Coordinates

Lesson 2 -- Distance in a Plane, Functions, Angles

Lesson 3 -- The Trigonometric Ratios and Functions

Unit 2-- Approximate Values and Right Triangles

Lesson 1 -- Finding and Using Approximate Values of the Functions

Lesson 2 -- Reference Angles, Right Triangles, and Special Angles

Lesson 3 -- Solving, Applying Right Triangles

Unit 3-- Trigonometric Identities

Lesson 1 -- Introduction to Trigonometric Identities

Lesson 2 -- Functions of Two Angles

Lesson 3 -- Half-Angle Identities, Products and Sums

Unit 4-- Trigonometric Graphs and Equations

Lesson 1 -- Graphing the Trigonometric Functions

Lesson 2 -- Solving Trigonometric Equations

Lesson 3 -- Functions and Trigonometric Equations

Unit 5-- Logarithms and Oblique Triangles

Lesson 1 -- Logarithms

Lesson 2 -- Calculating and Solving Logarithmic Equations

Lesson 3 -- Solving Oblique Triangles

Unit 6-- Vectors, Complex Numbers, Polar Coordinates

Lesson 1 -- Vectors and Vector Applications

Lesson 2 -- Complex Numbers and Operations

Lesson 3 -- Polar Coordinates and Equations

Course Objectives:

- Use the calculator and tables to evaluate trigonometric functions and angles.
- Use reference angles to find trigonometric functions, and apply trigonometric functions to solve right triangles.

- Solve applied problems using line of sight, angle of elevation, angle of depression, bearing, and other practical settings.
- Simplify or prove trigonometric expressions by using trigonometric identities.
- Use the formulas for the sine, cosine, and tangent of the sum and difference of two angles and for twice an angle and half an angle.
- Use sine and cosine product and sum formulas.
- Define and sketch graphs of the six trigonometric functions, and find periods and amplitudes.
- Solve trigonometric equations and check for extraneous solutions.
- Find, graph, evaluate, and solve inverse trigonometric functions.
- Solve problems involving logarithmic and exponential expressions.
- Find missing parts and areas of oblique triangles.
- Solve problems using vectors.
- Apply operations on complex numbers, sketch graphs of polar equations, and convert numbers and equations from rectangular to polar system and vice versa.

Number/Description of Projects, Exams, Activities, etc.:

- **6 Notebook Assignments** - Each unit contains a notebook assignment based on content covered in that unit. The questions require students to expand on various aspects of the content through discussion and/or exploration external to the course. Students are referred to an online discussion group or given World Wide Web links to begin their exploration.
- **6 Evaluations** - At the end of each unit there is a Unit Evaluation. The evaluations vary in the number of questions by unit but contain only multiple-choice questions.
- **Midterm and Final Evaluations** - There is a Midterm Evaluation to be completed after the Unit 3 Evaluation and the Midterm Review. There is also a Final Evaluation to be completed after the Unit 6 Evaluation and the Final Review. The Final Evaluation covers content from Units 4, 5, and 6.

Materials: All course materials have been approved for district use.

Timelines & Methods for evaluating student progress: Students are expected to log in daily and submit assignments on a weekly basis. Progress will be evaluated each month based progress towards assignment completion of assignments.

This course meets state and district graduation requirements in the area of Algebra.

Weekly contact will be conducted through a submitted assignment with instructor feedback. Students who do not submit an assignment are expected to email or call his/her instructor.

Each student is expected to spend a minimum of five hours per week on this course. Additional hours may be necessary to complete the course successfully.

Beginning & end date