

Course Syllabus

Course Name: Pre-Calculus

Description:

Dive deeper into your knowledge of functions by analyzing their key features and combining them to solve real-world problems. Learn about trigonometric functions and their applications, along with new ways to use the coordinate plane to represent different types of functions. Apply these skills to discover the power mathematics has in everyday life and to prepare for advanced mathematical studies in college or your future career.

Estimated Completion Time: 2 Segments /32–36 weeks
Segment One

Module 01: Functions

- Key Features of Functions and Their Graphs
- Polynomial Functions
- Rational Functions
- Radical Functions
- Exponential Functions
- Logarithmic Functions
- Piecewise Functions

Module 02: Applications of Functions

- Compare Key Features of Functions
- Systems of Equations
- Combining Functions
- Composing Functions
- Inverse Functions
- Difference Quotient

Module 03: Conic Sections

- Exploring Conic Sections
- Circles

- Parabolas
- Ellipses
- Hyperbolas Applications Using Conic Sections

Module 04: Sequences and Series

- Sequences vs. Series
- Arithmetic Sequences
- Geometric Sequences
- Series
- Applications of Sequences and Series

Segment Two

Module 05: Trigonometry

- Defining Trigonometric Functions and Their Angles
- Law of Sines
- Law of Cosines
- Unit Circle
- Making the Unit Circle Work for You
- Graphing the Sine and Cosine Functions
- Graphing Other Trigonometric Functions
- Analyzing Trigonometric Functions

Module 06: Trigonometric Identities and Formulas

- Trigonometric Identities
- Angle Sum and Difference Formulas
- Double-Angle and Half-Angle Formulas
- Applying Trigonometric Identities
- Solving Trigonometric Equations

Module 07: Vectors

- What is a vector?
- How are vectors written?
- What vector operations can be applied?

- How are vectors multiplied?
- Can vectors change size?
- Why are vectors useful?

Module 08: Analyzing the Coordinate Plane

- Polar Coordinates
- Polar Equations
- Complex Numbers
- Applications of Complex Numbers
- Parametric Equations

Course Assessment and Participation Requirements:

To achieve success, students are expected to submit work in each course weekly. Students can learn at their own pace; however, "any pace" still means that students must make progress in the course every week. To measure learning, students complete self-checks, practice Lessons, multiple choice questions, and discussion-based assessments. Students are expected to maintain regular contact with teachers; the minimum requirement is monthly. When teachers, students, and Parents work together, students are successful.