**HOUSATONIC**
COMMUNITY COLLEGE

**Course Name:** Pre-Calculus

**Course Number:**  MAT*E186

**Credits:** 4

**Catalog description:** This course offers a study of the concepts from algebra and trigonometry that will be used in calculus. The course topics include: trigonometric functions, periodic functions, trigonometric identities and equations, further applications of trigonometry, analytic geometry, and sequence and series.

**Prerequisite:** Satisfactory score on placement exam, or MAT*172 with a grade of C or higher.

# General Education Competencies Satisfied:

**HCC General Education Requirement Designated Competency Attribute Code(s):**
☒ **QUAX**　　　　　　　**Quantitative Reasoning**

**Discipline-Specific Attribute Code(s):**
☒ **MATH**　　　　　　　**Mathematics elective**

## Course objectives:

**General Education Goals and Outcomes:**

☒ **Quantitative Reasoning:** Students will learn to recognize, understand, and use the quantitative elements they encounter in various aspects of their lives. Students will develop a habit of mind that uses quantitative skills to solve problems and make informed decisions.

**Course Specific Objectives:**
1. To become proficient in algebraic and trigonometric techniques to be used in the study of calculus.
2. To examine trigonometric functions analytically, numerically, and graphically.
3. To be able to solve equations related to trigonometric functions.
4. To translate a verbal problem into a mathematical model.
5. To utilize the available technology.
6.Evaluate the results obtained from quantitative methods for accuracy and /or reasonableness by solving problems analytically and graphically.

**MAT*E186**

**Course Content:**

- **Trigonometric Functions**
  - Introduction to Trigonometric Functions
  - Angles
  - Unit Circle: Sine and Cosine Functions
  - The Other Trigonometric Functions
  - Right Triangle Trigonometry
- **Periodic Functions**
  - Introduction to Periodic Functions
  - Graphs of the Sine and Cosine Functions
  - Graphs of the Other Trigonometric Functions
  - Inverse Trigonometric Functions
- **Trigonometric Identities and Equations**
  - Introduction to Trigonometric Identities and Equations
  - Solving Trigonometric Equations with Identities
  - Sum and Difference Identities
  - Double-Angle, Half-Angle, and Reduction Formulas
  - Sum-to-Product and Product-to-Sum Formulas
  - Solving Trigonometric Equations
  - Modeling with Trigonometric Equations
- **Further Applications of Trigonometry**
  - Introduction to Further Applications of Trigonometry
  - Non-right Triangles: Law of Sines
  - Non-right Triangles: Law of Cosines
  - Polar Coordinates
  - Polar Coordinates: Graphs
  - Parametric Equations
  - Parametric Equations: Graphs
- **Analytic Geometry**
  - Introduction to Analytic Geometry
  - The Ellipse
  - The Hyperbola
  - The Parabola
- **Sequences and Series**
  - Introduction to Sequences and Series
  - Sequences and Their Notations
  - Arithmetic Sequences
  - Geometric Sequences
  - Series and Their Notations

Date of revisions: REV. 6/04; 8/30/04

**MAT*E186**

REV. 11/06
REV 1/2015
REV 1/2017
REV 2/27/2017

**MAT*E186**