Mathematics 170
Precalculus Trigonometry (3)
(Effective Fall 2020)

Prerequisite: EITHER two units of high school algebra, one unit of high school geometry, and appropriate mathematics placement OR completion of MATH 110 or 140 with a grade of C or better. Credit may not be received for both MATH 170 and 185.

Catalog Description: Trigonometric functions, identities, graphs, equations, harmonic motion, trigonometric form of complex numbers, vectors, dot product, and conics. Applications of trigonometric functions.

Notes:
1. All students in this course will take the Department of Mathematics and Statistics common final exam.
2. This course requires a graphing calculator. The department recommends a calculator of the TI-83, TI-84 series for this course. Computer algebra systems are prohibited. A TI-Nspire may only be used with a TI-84 faceplate.
3. Some instructors may require Pearson's MyMathLab or the MAA's Webworx, both computer/internet supplements to the textbook.

General Education: This is a prerequisite to the general education course Math 251. As such it also supports the following general education curriculum goals and student learning outcomes:

Curriculum Goals: The purpose of the Mathematics requirement is to teach students to organize, evaluate and solve problems using both abstract and quantitative approaches. Courses in this area will enable students to communicate using the language of mathematics.

Student Learning Outcomes:

a. Students will use appropriate notation and vocabulary to communicate mathematics.
b. Students will use symbolic and numerical methods to perform calculations.
c. Students will solve problems with real-world applications.

Teaching Objectives: The student will:

1. Understand geometric representations of angles and degree measure.
2. Define the six trigonometric functions via reciprocal identities, Pythagorean identity and quotient identities.
3. Solve triangles (law of sines, law of cosines, etc.).
4. Define the six trigonometric ratios of a right triangle.
5. Evaluate trigonometric functions via reference angles.
6. Evaluate trigonometric functions using a calculator
7. Solve applications of right triangle trigonometry (angle of elevation or depression etc.).
8. Define radian measure, arc length, and area of a sector.
9. Evaluate trigonometric functions via the unit circle.
10. Solve applications of the unit circle (linear speed vs angular speed, etc.).
11. Graph the six trigonometric functions.
12. Solve applications of sinusoidal functions (harmonic motion etc.).

13. Verify trigonometric identities.
14. Define the inverse trigonometric functions.
15. Solve trigonometric equations via identities and algebra.
16. Solve trigonometric equations via the calculator.
17. Application: Define and use vectors (basic operations, dot product, etc.).
18. Application: Polar form of complex numbers (product and quotient theorems, De Moivres Theorem, etc.).
19. Work with the basic equations and graphs and rotation of the conics.

Text(s): <u>Algebra & Trigonometry Enhanced with Graphing Utilities</u>, Eighth Edition, Michael Sullivan and Michael Sullivan III, Pearson, 2021. ISBN: 9780136857969 (This is the ISBN for a book and MyMathLab access. There are several options including rentals and E-books).

MyMathLab or WeBWorK computer supplement (ask instructor).

Outline:

Chapter	Title (Sections)	Days
7	Trigonometric Functions (1–8)	10
8	Analytic Trigonometry (1–7)	8
9	Applications of Trigonometric Functions (1–4)	6
10	Polar Coordinates; Vectors (1–5)	6
11	Analytic Geometry (1–5)	6
	One period tests	4
	Total days	40

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