

Course: MATH 1213 Plane Trigonometry

Catalog Description:

A survey of basic trigonometric concepts. Topics include trigonometric functions; graphs of trigonometric functions; trigonometric identities and equations; inverse trigonometric functions; the laws of sines and cosines; area; vectors; applications of trigonometry; complex numbers; and polar coordinates, equations, and graphs.

Prerequisite:

MATH 1204 with a grade of C or better, or appropriate placement scores.

Credit/Contact/Load Hours:

3 credit hours, 3 contact hours, 3 load hours

Target Audience and Transfer:

Trigonometry is required for students who will take Calculus I and / or College Physics. It is designed to transfer as 3 credit hours of Plane Trigonometry.

Course Outcomes:

Upon successful completion of this course students should exhibit mastery of certain knowledge and basic skills. These skills include, but are not limited to:

1. Analyzing and classifying angles, converting between units, using the Arc Length Formula, and using the relationship between linear and angular speed.
2. Defining, applying, and finding the exact values of the six trigonometric functions.
3. Determining the exact values of the six trigonometric functions of common angles in both degrees and radians without the aid of a calculator or other resources.
4. Graphing the six trigonometric functions by hand and analyzing and writing equations of simple harmonic motion.
5. Verifying and applying trigonometric identities.
6. Solving trigonometric equations.
7. Defining, using, and applying inverse trigonometric functions.
8. Defining, using, and applying the Law of Sines and Law of Cosines.
9. Performing operations with and applying vectors.
10. Converting complex numbers into trigonometric form & vice versa.
11. Converting between rectangular & polar coordinates and graphing polar coordinates and equations.
12. Graph parametrically defined curves and rewrite parametrically defined curves in their rectangular equivalent.

Required Text:

Trigonometry, 11th Edition. Lial, Hornsby, Schneider, Addison Wesley, 2017

REQUIRED CONTENT:

<u>Section</u>	<u>Topic</u>
1.1	Angles
1.3	Trigonometric Functions
1.4	Using the Definitions of the Trigonometric Functions
2.1	Trigonometric Functions of Acute Angles
2.2	Trigonometric Functions of Non-Acute Angles
2.3	Finding Trigonometric function Values Using a Calculator
2.4	Solving Right Triangles

2.5	Further Applications of Right Triangles
3.1	Radian Measure
3.2	Applications of Radian Measure
3.3	The Unit Circle and Circular Functions
3.4	Linear and Angular Speed
4.1	Graphs of the Sine and Cosine Functions
4.2	Translations of the Graphs of the Sine and Cosine Functions
4.3	Graphs of the Tangent and Cotangent Functions
4.4	Graphs of the Secant and Cosecant Functions
4.5	Harmonic Motion
5.1	Fundamental Identities
5.2	Verifying Trigonometric Identities
5.3	Sum and Difference Identities for Cosine
5.4	Sum and Difference Identities for Sine and Tangent
5.5	Double-Angle Identities
5.6	Half-Angle Identities
6.1	Inverse Circular Functions
6.2	Trigonometric Equations I
6.3	Trigonometric Equations II
7.1	Oblique Triangles and the Law of Sines
7.2	The Ambiguous Case of the Law of Sines
7.3	The Law of Cosines
7.4	Geometrically Defined Vectors and Applications
7.5	Algebraically Defined Vectors and the Dot Product
8.1	Complex Numbers
8.2	Trigonometric Form of Complex Numbers
8.5	Polar Equations and Graphs
8.6	Parametric Equations, Graphs and Applications

Note: A variety of application problems from each required topic should be assigned.

OPTIONAL SECTIONS:

1.2, 6.4, 8.3, and 8.4, **A review of exponential and logarithmic functions is strongly recommended.**

Required Instructional Activity:

This course should be taught with the use of a graphing utility when appropriate. If students use the graphing calculator to graph trigonometric functions, instructors should still require them to write down the amplitude, period, phase shift, vertical shift, and 5 key points. Students should also be required to accurately graph two full periods of the function on paper.

Familiarity with the unit circle and the ability to memorize or quickly determine the values of the trigonometric functions for common angles without the aid of a calculator is vital for the students' success in calculus and is a required component of this course.

Required Forms of Assessment:

Each instructor must include a set of 6 departmental final exam questions on his or her final exam. These questions will be in direct support of the specific Course Outcomes and will be based on material covered in the Required Text Coverage section, and be similar to the questions on the Departmental Review Sheet for Trigonometry. These questions should be evenly weighted on the final and should compose at least 10% of the students' overall grade in the course. The questions will be graded using a departmental grading rubric utilizing a 10-point scale per question. The results of these questions and overall student performance will be reported when final grades are turned in. *Please note that the only resource other than a graphing calculator allowed for use by students during the final exam will be a departmental formula sheet. It is also a departmental policy that no TI-89 or TI-92 or comparable calculators be allowed for use during the final exam.*

Instructor Resources:

Annotated Instructor's Edition	Instructor's Solutions Manual	Instructor's Testing Manual
TestGen	Insider's Guide	Pearson Adjunct Support Center
Classroom Example PowerPoints	PowerPoint Lecture Presentations and Active Learning Questions	
MathXL	MyMathLab	

Student Resources:

Student's Solutions Manual
A Review of Algebra
MyMathLab
MathXL

Graphing Calculator Manual
Video Lectures on CD with Optional Captioning
Additional Skill and Drill Manual
InterAct Math Tutorial Web site: www.interactmath.com