

CATALOG INFORMATION

Dept and Nbr: MATH 58            Title: PRECALCULUS TRIGONOMETRY  
Full Title: Precalculus Trigonometry  
Last Reviewed: 2/10/2020

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	3.00	Lab Scheduled	0	6	Lab Scheduled	0
		Contact DHR	0		Contact DHR	0
		Contact Total	3.00		Contact Total	52.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00

Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable  
Grading:            Grade Only  
Repeatability:    00 - Two Repeats if Grade was D, F, NC, or NP  
Also Listed As:  
Formerly:

**Catalog Description:**  
Trigonometric functions and their graphs, trigonometric identities, trigonometric equations, inverse trigonometric functions, complex numbers in trigonometric form, polar coordinates, parametric equations, vectors, and applications.

**Prerequisites/Corequisites:**  
Completion of MATH 154 or MATH 155 or higher; or Qualifying Placement from Math Assessment.  
See Student Success & Assessment Services ([assessment.santarosa.edu](http://assessment.santarosa.edu)) for more information about the assessment process.

**Recommended Preparation:**

**Limits on Enrollment:**

**Schedule of Classes Information:**  
Description: Trigonometric functions and their graphs, trigonometric identities, trigonometric equations, inverse trigonometric functions, complex numbers in trigonometric form, polar coordinates, parametric equations, vectors, and applications. (Grade Only)

Prerequisites/Corequisites: Completion of MATH 154 or MATH 155 or higher; or Qualifying Placement from Math Assessment.

See Student Success & Assessment Services ([assessment.santarosa.edu](http://assessment.santarosa.edu)) for more information about the assessment process.

Recommended:

Limits on Enrollment:

Transfer Credit: CSU;

Repeatability: Two Repeats if Grade was D, F, NC, or NP

## **ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:**

<b>AS Degree:</b>	<b>Area</b>		<b>Effective:</b>	<b>Inactive:</b>
	B	Communication and Analytical Thinking	Fall 2006	
	B	Communication and Analytical Thinking	Fall 1981	Fall 1999
<b>CSU GE:</b>	MC	Math Competency		
	<b>Transfer Area</b>		<b>Effective:</b>	<b>Inactive:</b>
	B4	Math/Quantitative Reasoning	Fall 2006	
	B4	Math/Quantitative Reasoning	Fall 1981	Fall 1996
<b>IGETC:</b>	<b>Transfer Area</b>		<b>Effective:</b>	<b>Inactive:</b>
<b>CSU Transfer:</b>	Transferable	<b>Effective:</b>	Fall 2006	<b>Inactive:</b>
<b>UC Transfer:</b>		<b>Effective:</b>		<b>Inactive:</b>

**CID:**

**Certificate/Major Applicable:**

Both Certificate and Major Applicable

## **COURSE CONTENT**

### **Outcomes and Objectives:**

Upon completion of the course, students will be able to:

1. Define the trigonometric functions using both the right triangle and unit circle methods.
2. Use radian measure to find arc length, sector area, and linear and angular velocity.
3. Verify trigonometric identities.
4. Solve equations involving trigonometric functions both graphically and analytically.
5. Graph trigonometric functions and their transformations.
6. Define and graph the inverse trigonometric functions.
7. Apply trigonometric functions and identities to solve application and modeling problems.
8. Solve right and oblique triangles using the trigonometric functions and the Laws of Sine and Cosine.
9. Represent complex numbers in, and perform operations using, trigonometric form.
10. Use vectors to model applications in mathematics and science.

**Topics and Scope:**

- I. Trigonometric Functions
  - A. Radian and degree measures of angles
    - 1. Arc length
    - 2. Area of a sector
    - 3. Linear and angular velocity
  - B. Right triangle and unit circle definitions
  - C. Characteristics of trigonometric functions
- II. Identities and Conditional Equations
  - A. Fundamental identities
  - B. Sum and difference identities
  - C. Related identities and their derivations
  - D. Conditional trigonometric equations and applications
- III. Graphical Representation of Trigonometric Functions
  - A. Amplitude and reflections
  - B. Period
  - C. Phase (horizontal) shifts
  - D. Vertical shifts
- IV. Inverse Functions
  - A. Definitions
  - B. Properties of inverse functions
  - C. Inverse trigonometric functions and their graphs
- V. Solutions of Triangles
  - A. Right triangles
  - B. Oblique triangles
  - C. Laws of Sines and Cosines
  - D. Applications
- VI. Complex Numbers, Polar Coordinates, and Parametric Equations
  - A. Definitions
  - B. Operations
  - C. Graphical representation of complex numbers
  - D. DeMoivre's Theorem
  - E. Polar coordinates
  - F. Parametric equations
- VII. Two Dimensional Vectors
  - A. Geometric and analytic definitions
  - B. Algebra of vectors
  - C. Trigonometric form of vectors
  - D. Dot product
  - E. Applications

**Assignment:**

- 1. Daily reading outside of class (20-50 pages per week).
- 2. Homework assignments from required text(s) or supplementary materials chosen by the instructor (1-6 per week).
- 3. Quizzes (0-4 per week).
- 4. Exams (3-8 per term).
- 5. Projects (for example, computer explorations or modeling activities, 0-10 per term).

## Methods of Evaluation/Basis of Grade:

**Writing:** Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments are more appropriate for this course.

Writing  
0 - 0%

**Problem Solving:** Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework assignments

Problem solving  
5 - 20%

**Skill Demonstrations:** All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

None

Skill Demonstrations  
0 - 0%

**Exams:** All forms of formal testing, other than skill performance exams.

Multiple choice and free response exams; quizzes

Exams  
70 - 95%

**Other:** Includes any assessment tools that do not logically fit into the above categories.

Projects

Other Category  
0 - 10%

## Representative Textbooks and Materials:

Analytic Trigonometry with Applications (11th ed.). Barnett, Ziegler, & Byleen. Wiley: 2012.  
PreCalculus: Mathematics for Calculus (6th ed.). Stewart, Redlin, and Watson. Brooks/Cole: 2012.