

MATH102S : Lab Support for Trigonometry

General Information

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Course Code (CB01) :	MATH102S
Course Title (CB02) :	Lab Support for Trigonometry
Department:	MATH
Proposal Start:	Fall 2022
TOP Code (CB03) :	(1701.00) Mathematics, General
CIP Code:	(27.0101) Mathematics, General.
SAM Code (CB09) :	Non-Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000619134
Curriculum Committee Approval Date:	Pending
Board of Trustees Approval Date:	Pending
Last Cyclical Review Date:	04/01/2020
Course Description and Course Note:	MATH 102S is a lab course to complement MATH 102 in the development and practice of essential study techniques and course material for success in Trigonometry. Topics include plane geometry, solving algebraic equations, simplifying algebraic expressions, coordinate plane, graphing techniques and basics of Trigonometry.
Justification:	New Course
Academic Career:	<ul style="list-style-type: none">Credit
Mode of Delivery:	No value
Author:	No value
Course Family:	No value

Academic Senate Discipline

Primary Discipline:	<ul style="list-style-type: none">Mathematics
Alternate Discipline:	No value
Alternate Discipline:	No value

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Pre-Collegiate Level (CB21)

One level below transfer.

Grading Basis

- Grade Only

Course Support Course Status (CB26)

Course is a support course

General Education and C-ID

General Education Status (CB25)

Not Applicable

Transferability

Not transferable

Transferability Status

Not transferable

Units and Hours

Summary

Minimum Credit Units (CB07) 0.5

Maximum Credit Units (CB06) 0.5

Total Course In-Class (Contact) Hours 36

Total Course Out-of-Class Hours 0

Total Student Learning Hours 36

Credit / Non-Credit Options

Course Type (CB04)

Credit - Not Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

Variable Credit Course

Funding Agency Category (CB23)

Not Applicable.

Cooperative Work Experience Education

Status (CB10)

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	0	0
Laboratory Hours	2	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	0

Laboratory	36
Studio	0
Total	36

Course Out-of-Class Hours

Lecture	0
Laboratory	0
Studio	0
Total	0

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Advisory

MATH15 - *Foundations of Algebra

Objectives

- Add, subtract, multiply, and divide real numbers;
- convert between percents, decimals and fractions
- solve introductory linear equations and inequalities;
- simplify introductory exponential expressions
- add, subtract, multiply and divide polynomials;
- graph introductory linear equations and inequalities;
- find the equation of a line;
- solve linear systems using graphing, substitution and elimination methods;
- use algebra to solve applied problems;
- factor polynomials;
- demonstrate knowledge of test-taking strategies and study skills.

OR

Co-Requisite

MATH102 - Trigonometry

Objectives

- Identify special triangles and their related angle and side measures;
- Evaluate the trigonometric function of an angle in degree and radian measure;
- Manipulate and simplify a trigonometric expression;
- Solve trigonometric equations, triangles, and applications;
- Graph the basic trigonometric functions and apply changes in period, phase and amplitude to generate new graphs;

- Evaluate and graph inverse trigonometric functions;
- Prove trigonometric identities;
- Convert between polar and rectangular coordinates and equations;
- Graph polar equations;
- Calculate powers and roots of complex numbers using DeMoivre's Theorem;
- Represent a vector (a quantity with magnitude and direction) in the form $a\mathbf{i} + b\mathbf{j}$

Entry Standards

Entry Standards	Description
No value	No value

Course Limitations

Cross Listed or Equivalent Course	Description
No value	No value

Specifications

Methods of Instruction

Methods of Instruction	Lecture
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Methods of Instruction	Laboratory
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Methods of Instruction	Discussion
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Methods of Instruction	Demonstrations
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Out of Class Assignments

computer or graphing calculator assignments;
reading and working exercises (e.g. working selected problems from textbook exercise sets).

Methods of Evaluation	Rationale
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Other worksheets reinforcing trigonometric concepts;
Exam/Quiz/Test quizzes;
Exam/Quiz/Test examinations.

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Dugopolski, Mark	Trigonometry	Pearson	2019	135207338

Other Instructional Materials (i.e. OER, handouts)

No Value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

Identify special triangles and their related angle and side measures;

evaluate the trigonometric function of an angle in degree and radian measure;

manipulate and simplify a trigonometric expression;

solve trigonometric equations, triangles, and applications;

graph the basic trigonometric functions and apply changes in period, phase and amplitude to generate new graphs;

evaluate and graph inverse trigonometric functions;

prove trigonometric identities;

convert between polar and rectangular coordinates and equations;

graph polar equations;

calculate powers and roots of complex numbers using DeMoivre's Theorem;

represent a vector (a quantity with magnitude and direction) in the form $\langle a, b \rangle$ and $ai + bj$.

SLOs

Demonstrate the ability to use algebraic skills in support of Trigonometry.

Expected Outcome Performance: 0.0

Course Content

Lecture Content

No value

Laboratory/Studio Content

Lab Content:

The Trigonometric Functions (6 hours)

- Multiply simple rational expressions
- Use rational expressions in conversions
- Find area and circumference of a circle
- Simplify square roots
- Perform operations with square roots
- Use the Pythagorean Theorem to find missing sides of a right triangle
- Find the center and radius of a circle given the equation for the circle
- Find the inverse of a function
- Similar triangles
- Angle relationships
 - Supplementary angles
 - Complimentary angles
 - Corresponding angles

Radian Measure and Graphing (6 hours)

- Shift graphs of algebraic functions horizontally and vertically
- Find domain and range of algebraic functions
- Reflecting, stretching and shrinking of algebraic functions
- Write equations of horizontal and vertical lines
- Perform arithmetic with fractions involving pi
- Find horizontal and vertical asymptotes for rational functions
- Identify domain and range of rational functions

Trigonometric Identities (4 hours)

- Recognize identities in algebra
- Use the Fundamental Identity from Trigonometry to simplify expressions

- Use reciprocal identities to simplify expressions
- Multiply binomials
- Square a binomial
- Factor expressions into a product of two binomials
- Find compositions of algebraic functions
- Prove that an equation is not an identity
- Operations with rational expressions in algebra

Trigonometric Equations and the Inverse Trigonometric Functions (6 hours)

- Evaluate a composition of algebraic functions
- Identify identities in Trigonometry
- Solve proportions for a variable
- Solve for a variable in an algebraic equation
- Solve quadratic equations by factoring
- Solve quadratic equations by using the square root property
- Solve quadratic equations by using the quadratic formula
- Squaring both sides of an equation and getting extraneous roots
- Domain and range of the trigonometric functions
- Finding the exact values of all six trigonometric functions

Oblique Triangles (4 hours)

- Solve proportions for x
- Solve proportions using the inverse sine on inverse cosine function
- Find the area of a triangle using the standard formula
- Solve right triangles
- Find the distance between two points with the distance formula

Complex Numbers and Polar Coordinates (4 hours)

- Simplify square roots
- Add and subtract binomials
- Multiply binomials
- Find n th roots with $1/n$ notation
- Solve cubic equations
- Find sine and cosine of large angles

Affective Doman (6 hours)

- Study plans
- Mindset (growth, resilience, hardiness and grit)
- Reading and cognitive techniques
- Study and test taking skills

total=36