

Glendale College

Course Outline of Record Report

Course ID 003254

Revision - May 2023

MATH110 : Precalculus

General Information

Author:	<ul style="list-style-type: none"> Suzanne Palermo
Course Code (CB01) :	MATH110
Course Title (CB02) :	Precalculus
Department:	MATH
Proposal Start:	Fall 2023
TOP Code (CB03) :	(1701.00) Mathematics, General
CIP Code:	(27.0101) Mathematics, General.
SAM Code (CB09) :	Non-Occupational
Distance Education Approved:	Yes
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000609167
Curriculum Committee Approval Date:	05/10/2023
Board of Trustees Approval Date:	06/20/2023
Last Cyclical Review Date:	05/01/2019
Course Description and Course Note:	MATH 110 is an accelerated precalculus course which prepares students for calculus. Topics include polynomial, absolute value, radical, rational, exponential, logarithmic, and trigonometric functions and their graphs, inverses, zeroes and applications. Inequalities, trigonometric identities, conic sections, polar equations, parametric equations, systems of equations and mathematical induction are also covered. Note: A maximum of 7 units may be earned from Math 110 with any combination of Math 110A and Math 110B. A maximum of 5 units may be earned from Math 110 and Math 100.
Justification:	Coding/Category Change
Academic Career:	<ul style="list-style-type: none"> Credit
Author:	<ul style="list-style-type: none"> Suzanne Palermo

Academic Senate Discipline

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

Transferability & Gen. Ed. Options

General Education Status (CB25)
GE Status (CSU) B4, (UC) 2

Transferability

Transferable to both UC and CSU

Transferability Status

Approved

IGETC Area	Area	Status	Approval Date	Comparable Course
2-Math	Mathematical Concepts and Quantitative Reasoning	Approved	09/09/1991	No Comparable Course defined.

CSU GE-Breadth Area	Area	Status	Approval Date	Comparable Course
B4-Mathematics/Quantitative Reasoning	Mathematics/Quantitative Reasoning	Approved	No value	No Comparable Course defined.

C-ID	Area	Status	Approval Date	Comparable Course
MATH	Mathematics	Pending	No value	MATH 155 - Precalculus

Units and Hours

Summary

Minimum Credit Units (CB07)	5
Maximum Credit Units (CB06)	5
Total Course In-Class (Contact) Hours	90
Total Course Out-of-Class Hours	180
Total Student Learning Hours	270

Credit / Non-Credit Options

Course Type (CB04) Credit - Degree Applicable	Noncredit Course Category (CB22) Credit Course.	Noncredit Special Characteristics No Value
Course Classification Code (CB11) Credit Course. <input type="checkbox"/> Variable Credit Course	Funding Agency Category (CB23) Not Applicable.	<input type="checkbox"/> Cooperative Work Experience Education Status (CB10)

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	5	10
Laboratory Hours	0	0

Course Student Hours

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

Studio Hours	0	0	Lecture	90
			Laboratory	0
			Studio	0
			Total	90
Course Out-of-Class Hours				
			Lecture	180
			Laboratory	0
			Studio	0
			Total	180

Time Commitment Notes for Students

No value

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

Prerequisite

MATH102 - Trigonometry

Objectives

- Solve trigonometric equations, triangles, and applications;
- Graph the basic trigonometric functions and apply changes in period, phase and amplitude to generate new graphs;
- Prove trigonometric identities;
- apply the basic definitions of trigonometry to solve right triangle application problems;
- apply the laws of sines and cosines to solve application problems;

Entry Standards

Entry Standards

No value

Specifications

Methods of Instruction

Methods of Instruction Lecture

Methods of Instruction Discussion

Methods of Instruction	Multimedia										
Methods of Instruction	Collaborative Learning										
Methods of Instruction	Demonstrations										
Out of Class Assignments <ul style="list-style-type: none"> • Homework (e.g. problem sets related to course content) • Group assignments and projects (e.g. find a real-life application and prepare a presentation) • Online graphing software or computer assignments 											
Methods of Evaluation	Rationale										
Exam/Quiz/Test	Quizzes										
Exam/Quiz/Test	Four to seven chapter examinations are required										
Exam/Quiz/Test	A comprehensive final examination is required										
Textbook Rationale No Value											
Textbooks <table border="1"> <thead> <tr> <th>Author</th> <th>Title</th> <th>Publisher</th> <th>Date</th> <th>ISBN</th> </tr> </thead> <tbody> <tr> <td>Stewart, James</td> <td>Precalculus, Custom Edition for Glendale College</td> <td>Cengage Learning</td> <td>2015</td> <td>9780357958520</td> </tr> </tbody> </table>		Author	Title	Publisher	Date	ISBN	Stewart, James	Precalculus, Custom Edition for Glendale College	Cengage Learning	2015	9780357958520
Author	Title	Publisher	Date	ISBN							
Stewart, James	Precalculus, Custom Edition for Glendale College	Cengage Learning	2015	9780357958520							
Other Instructional Materials (i.e. OER, handouts) No Value											

Learning Outcomes and Objectives

Course Objectives

Solve equations including rational, linear, polynomial, exponential, absolute value, radical, and logarithmic

Apply functions to model real world applications

Solve linear, non-linear, and absolute value inequalities

Graph the following types of functions and relations: polynomial, rational, exponential, logarithm, and conic section

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

Apply transformations to the graphs of functions and relations

Recognize the relationship between functions and their inverses graphically and algebraically

Evaluate and graph inverse trigonometric functions

Solve exponential and logarithmic equations

Apply the Fundamental Theorem of Algebra and related theorems to find the roots of a polynomial

Solve linear and non-linear systems of equations and inequalities

Apply the method of partial fraction decomposition

Prove various trigonometric identities

Evaluate a trigonometric function at an angle whose measure is given in degrees and radians

Simplify trigonometric expressions

Solve trigonometric equations

Apply the basic definitions of trigonometry to solve right triangle application problems

apply the laws of sines and cosines to solve application problems

Graph both polar and parametric equations

convert between polar and rectangular coordinates

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

SLOs

Solve and graph algebraic equations, inequalities, and systems of equations.

Expected Outcome Performance: 70.0

ILOs
General Education apply techniques of analysis and critical thinking to critique real world and theoretical topics and issues

MATH
Mathematics - A.A. Degree Major solve applications in math and science using derivatives, integrals, differential equations and linear algebra.

Use trigonometric identities as well as solve and graph trigonometric equations that may involve vectors, complex numbers, and/or polar coordinates.

Expected Outcome Performance: 70.0

ILOs
General Education apply techniques of analysis and critical thinking to critique real world and theoretical topics and issues

MATH
Mathematics - A.A. Degree Major solve applications in math and science using derivatives, integrals, differential equations and linear algebra.

Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?

No Value

Is this proposal submitted in response to learning outcomes assessment data?

No Value

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content**Basic Concepts (3)**

- Real numbers
- Exponents and radicals
- Algebraic expressions
- Rational expressions

Equations and Inequalities (6)

- First degree equations
- Quadratic equations
- Complex numbers
- Other types of equations (rational, radical, absolute value)
- Linear and absolute value inequalities
- Quadratic and other non-linear inequalities
- Applications

Functions and Their Graphs (9)

- Cartesian Coordinate System
- Function (linear, polynomial, rational, radical, absolute value) definition, evaluation, domain and range
- Graphs of functions (linear, quadratic, rational, radical, absolute value) including vertices, asymptotic behavior, and intercepts
- Transformations of functions (linear, quadratic, rational, radical, absolute value)
- Quadratic functions
- Algebra of functions
- One-to-one functions and inverses

Polynomial Functions (9)

- The Remainder Theorem and the Factor Theorem
- Synthetic division
- The Fundamental Theorem of Algebra
- Rational roots
- Graphing polynomial functions
- Rational functions

Exponential and Logarithmic Functions (7)

- Exponential functions
- Logarithmic functions
- Transformations of exponential and logarithmic functions
- Properties of logarithms
- Exponential and logarithmic equations
- Common and natural logarithms
- Applications

Systems of Equations and Inequalities (5)

- Systems of linear equations and inequalities in 2 variables
- Systems of linear equations (including Guassian Elimination) in more than 2 variables
- Non-linear systems of equations in 2 variables

Other Topics (6)

- Conic sections – analytic geometry
- Partial fraction decomposition
- Sigma notation
- Sequences and series

Trigonometric Functions (6)

- Definition of the six trigonometric functions of a right triangle
- Definition of the six trigonometric functions of any angle on the rectangular coordinate system
- Inverse trigonometric functions
- Right triangle trigonometry and applications

Radian Measure and Graphing (10)

- Radian measure
- Linear and angular velocity
- The six trigonometric functions on the unit circle
- Graphs of functions involving $\sin x$, $\cos x$, $\tan x$, $\cot x$, $\csc x$, and $\sec x$
- Graphs of the trigonometric functions: period, amplitude, phase shift, and asymptotes
- Other graphs involving trigonometric functions

Trigonometric Identities (11)

- Simplifying trigonometric expressions
- Identities involving sums and differences of two angles
- Double-angle identities
- Half-angle identities
- Sum-to-product and product-to-sum identities
- Proofs of trigonometric identities

Trigonometric Equations and Inverse Trigonometric Functions (5)

- Solving trigonometric equations
- Inverse trigonometric functions
- Graphs of inverse trigonometric functions

Oblique Triangles (3)

- The Law of Cosines
- The Law of Sines
- Areas of triangles

Vectors in Two Dimensions (4)

- The algebra of vectors
- The dot product
- Applications

Polar Coordinates (6)

- Polar coordinates
- Polar graphs
- Parametric equations

Total Hours=90