Glendale College

Course Outline of Record Report

Course ID 010235

Revision - May 2023

MATH110A : Precalculus I

General Information

Author:	• Suzanne Palermo
Course Code (CB01) :	MATH110A
Course Title (CB02) :	Precalculus I
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) :	CCC000567882
Curriculum Committee Approval Date:	05/10/2023
Board of Trustees Approval Date:	06/20/2023
Last Cyclical Review Date:	02/01/2020
Course Description and Course Note:	MATH 110A is the first of two courses that prepares students for calculus. Topics include first and second-degree equations and inequalities, the study of functions and their graphs (polynomial, absolute value, radical, rational, exponential, logarithmic), and remainder and factor theorems. Additional topics include a review of geometry, followed by an introduction to trigonometric functions, solving right triangles, elementary trigonometric identities, inverse trigonometric functions, and solving triangles using the Laws of Sines and the Law of Cosines. Note: You will receive a total of 5 units of credit for completion of Math 100 and Math 110A.
Justification:	Coding/Category Change
Academic Career:	• Credit
Author:	• Suzanne Palermo

Academic Senate Discipline

Primary Discipline:	• 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	08/31/2015	No Comparable Course defined.

CSU GE-Breadth Area	Area	Status	Approval Date	Comparable Course
B4-Mathematics/Quantitative Reasoning	Mathematics/Quantitative Reasoning	Approved	08/31/2015	No Comparable Course defined.

C-ID	Area	Status	Approval Date	Comparable Course
MATH	Mathematics	Approved	02/16/2016	MATH 955 - Precalculus & Trigonometry (must take MATH 110A and MATH 110B)

Units and Hours

Summary

Minimum Credit Units (CB07)	3.5
Maximum Credit Units (CB06)	3.5
Total Course In-Class (Contact) Hours	81
Total Course Out-of-Class Hours	108
Total Student Learning Hours	189

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.

Funding Agency Category (CB23)

Not Applicable.

Cooperative Work Experience Education Status (CB10)

Variable Credit Course

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	3	6
Laboratory Hours	1.5	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	54
Laboratory	27
Studio	0
Total	81
Course Out-of-Class Hours	
Lecture	108
Laboratory	0
Studio	0
Total	108

Time Commitment Notes for Students

No value

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

Prerequisite

MATH90 - Intermediate Algebra for BSTEM (in-development)

Objectives

- Solve absolute value equations and inequalities;
- solve linear equations and compound inequalities;
- perform operations with polynomials;
- perform operations with radical expressions;
- simplify expressions with rational exponents;
- solve rational equations;
- solve equations with radicals;
- solve a system of linear equations using elimination substitution;
- solve quadratic equations with real and complex solutions;
- find the inverse of a function;
- use the properties of logarithms to simplify and expand expressions;
- solve logarithmic and exponential equations;
- graph parabolas and circles centered at any point.
- graph functions (linear, quadratic, exponential, logarithmic);

OR

Prerequisite

Placement is based on academic background or satisfactory completion of MATH 90.

Entry Standards

Entry Standards	Description
No value	No value

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Methods of Instruction	Laboratory
Methods of Instruction	Discussion
Methods of Instruction	Collaborative Learning
Methods of Instruction	Demonstrations

Out of Class Assignments

- Homework (e.g. problems sets related to course content)
- Group assignments and projects (e.g. group project to solve a "challenging" application problem from the textbook)
- Graphing calculator and/or computer assignments (e.g. explore of the effects of changes in the form of a polynomial function to the shape of its graph)

Methods of Evaluation	Rationale
Exam/Quiz/Test	Quizzes
Exam/Quiz/Test	Four to seven chapter examinations are required
In-Class Activity (answering journal prompt, group activity)	Participation in lab activities
Exam/Quiz/Test	A two-hour and twenty-minute comprehensive final examination is required.

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Stewart, James	Precalculus, Custom Edition for Glendale College	Cengage Learning	2015	9780357958520
Tussy, Alan S, and R. David Gustafson	Basic Geometry for College Students	Brooks/Cole/Cengage	2010	0-495-82948-X

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

Description	Elementary College Geometry
Author	Africk, Henry
Citation	CUNY Academic Works
Online Resource(s)	https://open.umn.edu/opentextbooks/textbooks/508 (https://open.umn.edu/opentextbooks/textbooks/508) https://academicworks.cuny.edu/cgi/viewcontent.cgi?article=1051&context=ny_oers (https://academicworks.cuny.edu/cgi/viewcontent.cgi?article=1051&context=ny_oers)

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, and logarithm

Apply transformations to the graphs of functions and relations

Recognize the relationship between functions and their inverses graphically and algebraically

Solve exponential and logarithmic equations

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

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

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

Apply the laws of sines and cosines to solve application problems

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.

Apply trigonometric formulas and identities to solve right triangle problems. 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 (4)
- Real numbers
- Exponents and radicals
- Algebraic expressions
- Rational expressions

Equations and Inequalities (7)
- 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 (7)
- 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 (7)
- 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

Geometry Review (6)
- Properties of angles
- Triangles properties
- Circles
- Polygons and solids

Trigonometric Functions (7)
- 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 (5)
- Radian measure
- Definition of the six trigonometric functions on the unit circle
- (Optional) Linear and angular velocity

Oblique Triangles (4)
- The Law of Cosines
- The Law of Sines
- Areas of triangles

Total Hours=54

Laboratory/Studio Content

Basic Concepts (2)
- Real numbers
- Exponents and radicals
- Algebraic expressions
- Rational expressions

Equations and Inequalities (3)
- 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 (3)
- 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 (3)
- 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 (4)
- Exponential functions
- Logarithmic functions
- Transformations of exponential and logarithmic functions
- Properties of logarithms
- Exponential and logarithmic equations
- Common and natural logarithms
- Applications

Geometry Review (4)
- Properties of angles
- Triangles properties
- Circles
- Polygons and solids

Trigonometric Functions (4)
- 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 (2)
- Radian measure
- Definition of the six trigonometric functions on the unit circle
- (Optional) Linear and angular velocity

Oblique Triangles (2)
- The Law of Cosines
- The Law of Sines
- Areas of triangles

Total Hours=27