

EASTERN ARIZONA COLLEGE

Precalculus Algebra

Course Design

2017-2018

Course Information

Division Mathematics
Course Number MAT 154 (SUN# MAT 1151)
Title Precalculus Algebra
Credits 4
Developed by Gary Roth
Lecture/Lab Ratio 4 Lecture/0 Lab

Transfer Status

ASU	NAU	UA
MAT 117 (3) & MAT Dept Elective (1) , Mathematics (MA)	MAT Departmental Elective --and-- MAT 110; Foundation Requirement [FNRQ]	MATH 112

Activity Course No
CIP Code 27.0101
Assessment Mode Pre/Post Test (25 Questions/100 Points)
Semester Taught Fall and Spring
GE Category Mathematics
Separate Lab No
Awareness Course No
Intensive Writing Course No

Prerequisites

MAT 120 with a grade of "C" or higher or placement test score as established by District policy and ENG 091 with a grade of "C" or higher or reading placement test score as established by District policy

Educational Value

This course is designed for students with a solid algebra background who plan to take further instruction in mathematics.

Description

A first course to prepare students for calculus. Topics include functions, graphs, equations, exponentials, logarithms, systems with matrices. Optional topics may include conic sections, sequences, and series.

Supplies

Scientific calculator; TI-83 or TI-84 recommended

Competencies and Performance Standards

1. Apply algebraic techniques to solve equations.

Learning objectives

What you will learn as you master the competency:

- a. Solve linear equations and inequalities.
- b. Solve absolute value equations and inequalities.
- c. Solve quadratic equations by factoring or by completing the square or by using the quadratic formula.
- d. Solve radical equations.
- e. Solve rational equations.
- f. Solve exponential and logarithmic equations.

Performance Standards

You will demonstrate your competence:

- on assigned activities
- on written exams
- on a two-hour cumulative final exam

Your performance will be successful when:

- learner demonstrates the ability to solve a variety of algebraic equations and inequalities
- learner demonstrates the ability to translate word problems into algebraic equations

2. Analyze relations, functions, and their graphs.

Learning objectives

What you will learn as you master the competency:

- a. Distinguish between functions and non-functions.
- b. Determine the domain and range of functions.
- c. Use function notation.
- d. Determine the inverse of a function.
- e. Perform operations with functions: addition, subtraction, multiplication, division and composition.
- f. Sketch the graphs of a variety of basic algebraic functions.

Performance Standards

You will demonstrate your competence:

- with relations expressed in a variety of forms such as, tables, graphs, equations, sets of ordered pairs, verbal descriptions
- on assigned activities
- on written exams
- on a two-hour cumulative final exam

Your performance will be successful when:

- learner demonstrates the ability to distinguish between functions and non-functions
- learner determines the domain range and inverse of a relation
- learner reads and writes using function notation correctly
- learner performs operations of addition, subtraction, multiplication, and composition with

- functions
- learner sketches the graph of basic algebraic functions

3. Examine polynomial and rational functions in detail.

Learning objectives

What you will learn as you master the competency:

- a. Determine slope and intercepts of a linear function.
- b. Graph linear functions.
- c. Write the equation of a linear function.
- d. Determine the coordinates of the vertex and the intercepts of a quadratic function.
- e. Graph quadratic functions.
- f. Determine the zeros and the y- intercept of higher degree polynomial functions.
- g. Sketch higher degree polynomial functions.
- h. Determine the asymptotes and the intercepts of rational functions.
- i. Graph rational functions.

Performance Standards

You will demonstrate your competence:

- on assigned activities
- on written exams
- on a two-hour cumulative final exam

Your performance will be successful when:

- learner identifies the slope and intercepts, and sketches the graph of any linear function
- learner identifies the vertex and intercepts, and sketches the graph of any quadratic function
- learner identifies the zeros and y-intercept, and sketches the graph of higher degree polynomials
- learner identifies the asymptotes and intercepts, and sketches the graph of rational functions

4. Analyze the properties, graphs, and applications of exponential and logarithmic functions.

Learning objectives

What you will learn as you master the competency:

- a. Simplify exponential and logarithmic expressions.
- b. Solve exponential and logarithmic equations.
- c. Sketch the graphs of exponential and logarithmic functions.
- d. Apply exponential and logarithmic functions in various applications.
- e. Use the properties of logarithms to write using multiple logarithms.
- f. Use the properties of logarithms to write with a single logarithm.

Performance Standards

You will demonstrate your competence:

- on assigned activities
- on written exams
- on a two-hour cumulative final exam

Your performance will be successful when:

- learner simplifies exponential and logarithmic expressions
- learner solves exponential and logarithmic equations
- learner sketches the graphs of exponential and logarithmic functions
- learner correctly models real world situations with exponential or logarithmic functions

5. Apply systems of equations and matrices.

Learning objectives

What you will learn as you master the competency:

- a. Solve systems of equations using Gaussian Elimination or Gaussian-Jordan Elimination.
- b. Solve systems of equations using Cramer's Rule.
- c. Perform basic operations with matrices.
- d. Translate a word problem into a system of equations.

Performance Standards

You will demonstrate your competence:

- on assigned activities
- on written exams
- on a two-hour cumulative exam

Your performance will be successful when:

- learner solves a system of equations in two and three variables by the following methods: Gaussian Elimination or Gauss-Jordan Elimination
- learner performs matrix operations such as: adding, subtracting, multiplying and scalar multiplication
- learner solves a system of equations using Cramer's Rule
- learner translates a word problem into a system of equations

Types of Instruction

Classroom Presentation

Grading Information

Grading Rationale

Each instructor has the flexibility to develop evaluative procedures within the following parameters.

1. Written exams must represent at least 60% of the final course grade.
2. Final exam must represent at least 20% of the final course grade.
3. The Post Test is to be embedded in the final exam and must represent at least 10% of the final course grade.
4. Other activities may represent at most 20% of the final course grade.

Grading Scale

A	90%-100%
B	80%-89%
C	70%-79%
D	60%-69%
F	Below 60%