

Miami-Dade Community College
MAC 1105 COLLEGE ALGEBRA

Course Description Topics include: Linear, quadratic, rational, exponential, logarithmic, radical, and absolute value functions and their graphs; operations on functions; inverse functions; properties of logarithms; systems of equations and inequalities; non-linear inequalities; applications and modeling.

Pre-requisite: MAT 1033 with a grade of C or better or equivalent (3 hrs. lecture)

Credits: 3

Course Competencies:

Competency 1: The Student will demonstrate knowledge of complex numbers by:

- a. Writing the square root of a negative number in terms of i
- b. Simplifying powers of i
- c. Adding, subtracting, multiplying and dividing complex numbers.

Competency 2: The Student will demonstrate knowledge of functions, from a numerical, graphical, verbal and analytic perspective by:

- a. Finding the domain and range
- b. Distinguishing a function from a relation
- c. Using functional notation
- d. Performing operations with functions: adding, subtracting, multiplying, dividing and forming compositions
- e. Finding the inverse of a function

Competency 3: The Student will demonstrate knowledge of quadratic equations and functions by:

- a. Solving quadratic equations by the square root method
- b. Solving quadratic equations by completing the square
- c. Solving quadratic equations by using the quadratic formula
- d. Using quadratic equations and their solutions to answer modeling questions
- e. Using the discriminant to identify the types of solutions for quadratic equations
- f. Graphing quadratic functions, and identifying the vertex, the y -intercept and the axis of symmetry of the graph
- g. Finding the maximum or minimum value of a quadratic function in quadratic models
- h. Solving quadratic inequalities and using a similar procedure in solving inequalities involving quotients

Competency 4: The Student will demonstrate knowledge of absolute value, square root and rational functions by:

- a. Finding the domain and the range of these functions
- b. Graphing these functions
- c. Graphing these functions with translations

Competency 5: The Student will demonstrate knowledge of solving systems of linear equations and inequalities by:

- a. Problem solving and modeling using systems of equations
- b. Solving linear systems of equations in three variables
- c. Solving linear systems of equations using determinants
- d. Solving problems involving linear inequalities

Competency 6: The student will demonstrate knowledge of exponential and logarithmic functions by:

- a. Graphing exponential and logarithmic functions
- b. Identifying the domain and range of exponential and logarithmic functions.
- c. Applying properties of logarithms to expand and condense logarithmic expressions
- d. Solving exponential and logarithmic equations
- e. Applying modeling techniques to solve problems of exponential growth and decay