



# Course Syllabus

## Course Information

**Course Title:** College Algebra

**Subject and Number:** MAC 1105

**Course Description:** In this course, students will develop problem solving skills, critical thinking, computational proficiency, and contextual fluency through the study of equations, functions, and their graphs. Emphasis will be placed on quadratic, exponential, and logarithmic functions. Topics will include solving equations and inequalities, definition and properties of a function, domain and range, transformations of graphs, operations on functions, composite and inverse functions, basic polynomial and rational functions, exponential and logarithmic functions, and applications. Student learning outcomes: students will solve an equation or an inequality using an appropriate technique; students will define and describe functions, their properties, and graphs; students will manipulate functions to simplify expressions and find new functions; students will use transformations to write an equation for a function and to graph a function; and students will model and solve real world problems using functions. Prerequisite: MAT 1033 with a grade of "C" or better. Fulfills Gordon Rule computational requirement.

**Class Number:** LOREM IPSUM

**Term and Year:** LOREM IPSUM

**Course Modality:** [MDC Modalities](#)

## Instructor Information

**Name:** LOREM IPSUM

**Department and Campus:** LOREM IPSUM

**Office location:** LOREM IPSUM

**Office hours:** *(communicate course office hours with students)*

**Phone number:** 123-456-7890

**Email:** LOREM IPSUM

**Communication Policy:** *(Faculty will establish protocols for communication with students)*

## **Required Textbook, Course Materials, and Technology**

**Required course materials:** *(Textbook(s), library reserves, shark pack, and/or other required readings. Include ISBN Number and author(s))*

**List optional/supplemental materials/OER:** LOREM IPSUM

**Technology & Technical Skill Requirements:** *(Technology tools or equipment students need to complete this course are included)*

## **Grading Policy & Assessment Methods**

*List all activities, papers, quizzes, tests, etc. including grading scale used for final grade calculation. Relationships between the final grade and the learner's accumulated points or percentages/weights breakdown for each assessment or component of the course grade.*

*Include policy on late submissions.*

*For MDC Live and MDC Online courses, include policy regarding exams (e.g., ProctorU, Respondus Lockdown and Monitor, etc.)*

*If applicable, include guidelines for extra credit.*

**Incomplete Grades:** [View the college's procedures for Incomplete Grades](#)

## **Miami Dade College Policies**

**Attendance Policy:** *(Faculty include precise statements about illnesses/emergencies/ tardiness, missed assignments/make-up.)*

**Students Rights and Responsibilities:** *Policies addressing academic integrity and plagiarism, code of conduct, grade appeals, religious observations, services for students with special needs, student complaints, and other.*

[For more information, visit the Student's Rights and Responsibilities page](#)

## **Available Support Services & Resources**

- [Tutoring Labs and Technology – Learning Resources](#)
- [Virtual Tutoring through Learning Resources or Smarthinking Online Tutoring](#)
- [ACCESS: A Comprehensive Center for Exceptional Student Services](#)
- [Advisement](#)
- [Password and Login Technical Support](#)
- [Technical Support for MDC Live and MDC Online Courses](#)
- [SMART Plan](#)

*(Faculty select from the above if applicable and include additional course/campus specific resources)*

## **Available Support Services & Resources**

- [Public Safety - Services](#)
- [Hurricane and Other Natural Disasters](#): In the event of a hurricane or other disaster, the class follows the schedule established by the College for campus-based courses. Please visit the MDC website or call the MDC Hotline (305-237-7500) for situation updates.

## **Course Description**

**MAC1105 | College Algebra | 3 credits**

In this course, students will develop problem solving skills, critical thinking, computational proficiency, and contextual fluency through the study of equations, functions, and their graphs. Emphasis will be placed on quadratic, exponential, and logarithmic functions. Topics will include solving equations and inequalities, definition and properties of a function, domain and range, transformations of graphs, operations on functions, composite and inverse functions, basic polynomial and rational functions, exponential and logarithmic functions, and applications. Student learning outcomes: students will solve an equation or an inequality using an appropriate technique; students will define and describe functions, their properties, and graphs; students will manipulate functions to simplify expressions and find new functions; students will use transformations to write an equation for a function and to graph a function; and students will model and solve real world problems using functions. Prerequisite: MAT 1033 with a grade of "C" or better. Fulfills Gordon Rule computational requirement.

## **Course Competencies**

### **Competency 1:**

The student will demonstrate knowledge of absolute value equations and inequalities by:

- Solving absolute value equations.
- Solving absolute value inequalities.

#### Learning Outcomes

- Critical thinking
- Information Literacy
- Numbers / Data

### **Competency 2:**

The student will demonstrate knowledge of complex numbers by:

- Simplifying radicals with negative radicands by using the definition of  $i$ .
- Simplifying powers of  $i$ .
- Adding, subtracting, multiplying and dividing complex numbers.

#### Learning Outcomes

- Critical thinking
- Information Literacy
- Numbers / Data

### **Competency 3:**

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

- Distinguishing if a given relation is a function.
- Evaluating and using functional notation.
- Using the vertical line test to determine if a graph represents a function.
- Identifying and finding the domain and range of relations and functions.
- Performing operations on functions.
- Forming function compositions.
- Finding the inverse of a function.
- Graphing functions, including absolute value, radical and power functions with and without transformations.
- Graphing the inverse of a function.
- Analyzing and classifying the symmetry of functions.
- Defining, evaluating and graphing basic piecewise-defined functions.

#### Learning Outcomes

- Communication
- Critical thinking
- Information Literacy
- Numbers / Data
- Social Responsibility

### **Competency 4:**

The student will demonstrate knowledge of quadratic equations and functions by:

- Solving quadratic equations and equations quadratic in form using any available method.
- Using quadratic equations and their solutions to answer modeling questions.
- Using the discriminant to identify the types of solutions for quadratic equations.
- Graphing quadratic functions and identifying the vertex, x-intercept, y-intercept and the axis of symmetry of the graph.
- Finding the maximum or minimum value of a quadratic function in applications.

#### Learning Outcomes

- Communication
- Critical thinking
- Information Literacy
- Numbers / Data
- Social Responsibility

## **Competency 5:**

The student will demonstrate knowledge of systems of linear equations and inequalities by:

- Solving systems of linear equations into variables using Substitution and Addition (also known as Elimination) methods.
- Solving systems of linear equations in three variables.
- Solving systems of linear inequalities.
- Solving applications and modeling using systems of linear equations and inequalities.

### Learning Outcomes

- Communication
- Critical thinking
- Information Literacy
- Numbers / Data
- Social Responsibility

## **Competency 6:**

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

- Graphing exponential and logarithmic functions with and without transformations.
- Identifying the domain and range of an exponential or logarithmic function.
- Applying properties of logarithms to expand and condense logarithmic expressions.
- Solving exponential and logarithmic equations.
- Applying modeling techniques to solve problems of exponential growth and decay.

### Learning Outcomes

- Communication
- Critical thinking
- Information Literacy
- Numbers / Data
- Social Responsibility

## **Competency 7:**

The student will demonstrate knowledge of polynomial and rational functions and inequalities by:

- Graphing polynomial functions.
- Graphing rational functions.
- Determining domain of rational functions.
- Solving polynomial and rational inequalities and graphing their solution set.

### Learning Outcomes

- Critical thinking
- Information Literacy
- Numbers / Data

### **Competency 8:**

The student will demonstrate knowledge of equations in two variables by:

- Recognizing and graphing equations that represent circles.
- Writing the equation of the circle given the center and radius.
- Determining the distance between two points and midpoint coordinates.

### Learning Outcomes

- Critical thinking
- Information Literacy
- Numbers / Data