

**Miami Dade College  
InterAmerican Campus  
Mathematics Department  
College Algebra (MAC1105)  
Spring 2013-2**

**INSTRUCTOR:** Dr. Jose A Serpa  
**Room:** 1369

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**TEXTBOOK:** Algebra (6<sup>th</sup> Edition), Blitzer  
(textbook with My Math Lab)

**COURSE:** MAC1105

**MEETING DAYS/HRS.:** M,W,F  
9:00 am – 9:50 am  
**ROOM:** 1124

**REFERENCE:** 780627

**COURSE DESCRIPTION:**

This course introduces the student to the concept of functions and their graphs. Students will graph linear, quadratic, rational, exponential, logarithmic, radical, power, and absolute value functions and transformations; perform operations on and compositions of functions; find the inverse of a function; apply the laws of logarithms to simplify expressions and solve equations; graph non-linear inequalities; solve related applications and modeling problems.

**PREREQUISITE:**

MAT 1033 with a grade of C or better or equivalent.

**EVALUATION POLICY:**

There will be five tests (including the Midterm) worth 100 points each and a comprehensive mandatory Final Exam. HW will be posted online and will count as extra credits worth up to 10 additional points toward corresponding test. HW is due the same day of the corresponding test. The lowest grade among all five tests will be dropped. **There will be no makeups.** The Final Exam may **NOT** be dropped. Your final grade will be based on the average of your four best test scores and the Final Exam. I may assign the seating during any of the tests or Final Exam.

**COURSE GRADE FORMULA:** (sum of four best test scores with extra credits included+ final exam) / 5

**GRADING SCALE:**

90 – 100 = A; 80 - 89 = B; 70 -79 = C; 60 - 69 = D; 0 - 59 = F

**ATTENDANCE:**

Attendance to class is encouraged. Students are expected to attend and participate in class. Students are responsible for all material covered in class. Students who attend class, and do not appear on the class roll will be asked to report to the Register Office to obtain a paid/validation schedule. Under no circumstances you will be allowed to remain in class if your **schedule** is not **paid/validated**.

**MATH LAB:** Available on Campus, Room 1214

**DROPS/WITHDRAWALS:**

It is the student's responsibility to withdraw from the class if he/she should decide to in order to receive a grade of "W".

**CHEATING:**

Cheating will be no tolerated in this class. Any student caught will receive an automatic "F" in this class.

## **INCOMPLETES:**

Incompletes will be given in very limited situations. In order to qualify for an “I” grade, the student must be passing the course at the time the “I” grade is negotiated; be so near the end of the course that he/she requires no further instruction; and have a justifiable and documented reason for not being able to finish the course on schedule.

### **Course Outline: Blitzer (5<sup>th</sup> ed.)**

1.4 Complex Number System

1.5 Quadratic Equations

1.6 Radical Equations; Equations Quadratic in Form; Factorable

1.7 Solving Linear Inequalities and Absolute Value Inequalities

2.1 Basics of Functions & Their graphs

2.2 More on Functions & Their Graphs: Piecewise-defined functions

2.3 Linear Functions and Slope; Intercepts

2.4 More on Slope

2.5 Transformations of Functions: Library of Functions

2.6 Combination of Functions: Composite Functions

2.7 One-to-One Functions: Inverse Functions

2.8 The distance and midpoint formulas; Circles

3.1 Quadratic Functions

3.6 Polynomial & Rational Inequalities

4.1 Exponential Functions

4.2 Logarithmic Functions

4.3 Properties of Logarithms

4.4 Logarithmic and Exponential Equations

5.1 Systems of Linear Equations: Substitution and Elimination

5.2 Systems of Linear Equations in Three Variables

6.5 Systems of Linear Equations: Determinants & Cramer’s Rule

*I reserve the right to make changes in the test dates as needed. Any changes will be announced in class as early as possible*

<b>Tentative Schedule</b>	<b>Date</b>	
<b>Week 1</b>		<b>Introduction, 1.4</b>
<b>Week 2</b>		1.5, 1.6, 1.7
<b>Week 3</b>		<b>Review, Exam 1 (Ch. 1)</b>
<b>Week 4</b>		2.1, 2.2, 2.3
<b>Week 5</b>		2.4, 2.5, 2.6
<b>Week 6</b>		2.7, 2.8, Review
<b>Week 7</b>		<b>Review, Exam 2 (Ch. 2)</b>
<b>Week 8</b>		3.1, 3.6, Review
<b>Week 9</b>		<b>Review, Midterm (Chapters 1 – 3)</b>
<b>Week 10</b>		4.1, 4.2
<b>Week 11</b>		4.3, 4.4
<b>Week 12</b>		<b>Review, Exam 3 (Ch. 4)</b>
<b>Week 13</b>		5.1, 5.2
<b>Week 14</b>		6.5, Review
<b>Week 15</b>		<b>Review, Exam 4 (Ch. 5.1, 5.2 &amp; 6.5)</b>
<b>Week 16</b>		Final Review
<b>Week 17</b>		<b>Final Exam</b>

## MAC 1105 Course Competencies

- Competency 1: The student will demonstrate knowledge of absolute value equations and inequalities by:
- Solving absolute value equations
  - Solving absolute value inequalities
- Competency 2: The student will demonstrate knowledge of systems of linear equations by:
- Solving systems of linear equations in three variables (with or without technology)
  - Solving applications involving systems of linear equations
- Competency 3: The student will demonstrate knowledge of complex numbers by:
- Simplifying radicals that represent imaginary numbers
  - Adding, subtracting, multiplying, and dividing complex numbers.
- Competency 4: The student will demonstrate knowledge of quadratic equations and functions by:
- Using the discriminant to identify the types of solutions for quadratic equations.
  - Graphing quadratic function 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.
  - Finding the maximum or minimum value of a quadratic function in quadratic models.
  - Solving equations that are quadratic in form.
- Competency 5: 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 using functional notation
  - Using the vertical line test to determine if a graph represents a function
  - Identifying the domain and range of relations and functions
  - Recognizing and graphing nonlinear relations
  - Adding, subtracting, multiplying and dividing functions
  - Forming compositions of functions
  - Finding the inverse of a function
  - Graphing a function and its inverse function
  - Evaluating and graphing piecewise-defined functions
- Competency 6: The student will demonstrate knowledge of polynomial and rational functions and inequalities by:
- Graphing polynomial functions
  - Graphing rational functions
  - Solving polynomial inequalities and graphing their solution set
  - Solving rational inequalities and graphing their solution set
- Competency 7: The student will demonstrate knowledge of absolute value, radical and power functions by:
- Finding the domain and range of these functions
  - Graphing these functions and transformations
- Competency 8: The student will demonstrate knowledge of exponential and logarithmic functions by:
- Graphing exponential and logarithmic functions
  - Identifying the domain and range of exponential and logarithmic functions
  - Applying properties of logarithms to expand logarithmic expressions
  - Applying properties of logarithms to write logarithmic expressions as a single logarithm
  - Solving exponential and logarithmic equations
  - Applying modeling techniques to solve problems of exponential growth and decay
- Competency 9: The student will demonstrate knowledge of equations in two variables by:
- Recognizing and graphing equations that represent circles
  - Given the center and radius of a circle, writing the equation of the circle
  - Determining the distance between two points

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**How do the course objectives relate to the Miami Dade College Learning Outcomes?**

What follows below is a list of the ten learning outcomes that have recently been agreed upon by Miami Dade College faculty and administrators.

As graduates of Miami Dade College, students will be able to:

1. Communicate effectively using listening, speaking, reading, and writing skills.
2. Use quantitative analytical skills to evaluate and process numerical data.
3. Solve problems using critical and creative thinking and scientific reasoning.
4. Formulate strategies to locate, evaluate, and apply information.
5. Demonstrate knowledge of diverse cultures, including global and historical perspectives.
6. Create strategies that can be used to fulfill personal, civic, and social responsibilities.
7. Demonstrate knowledge of ethical thinking and its application to issues in society.
8. Use computer and emerging technologies effectively.
9. Demonstrate an appreciation for aesthetics and creative activities.
10. Describe how natural systems function and recognize the impact of humans on the environment.

Each course taken at the college addresses some of these learning outcomes. MAC1105, addresses outcomes 1, 2, 3, 4, 5, 8, 9.