

**Miami Dade College  
InterAmerican Campus  
Mathematics Department  
Pre-Calculus Algebra (MAC1140)  
FALL 2013-1**

**INSTRUCTOR:** Dr. Jose Serpa  
**OFFICE:** 1369

**PHONE:** (305) 237-6110  
**EMAIL:** *jserpa@mdc.edu*

**TEXTBOOK:** Sullivan, ALGEBRA AND TRIGONOMETRY (9<sup>th</sup> edition), Pearson Prentice  
ISBN: 0-32-177217-2 (Textbook with My Math Lab and Student Solution Manual)

**COURSE:**MAC1140

**REFERENCE:** 757539

**MEET DAYS:** TR 11:15- 12:30 pm

**ROOM:** 1374

**PREREQUISITE:** MAC 1105 with a grade of C or better or equivalent

**COURSE DESCRIPTION:**

This course is primarily designed for students who are majoring in areas that require one or more courses in the calculus sequence. The student will analyze and graph algebraic, exponential, logarithmic, piecewise-defined functions and conic sections. The student will solve polynomial, exponential and logarithmic equations, as well as systems of linear and nonlinear equations. The student will identify arithmetic and geometric sequences and series and solve related problems. The student will use the Binomial Theorem to expand polynomials and solve related problems. The student will use mathematical induction to prove statements regarding the properties of natural numbers. The student will solve applications and modeling problems related to the above topics. (3 hrs. lecture)

**CALCULATORS:** You will need a scientific calculator. If you have a graphing calculator, you are encouraged to use it, although you will not be able to use it for tests.

**TESTING AND GRADING POLICY:** There will be five tests worth 100 points each, and a cumulative final exam. **THERE ARE NO MAKEUPS.** See me if you know you are going to miss a test.

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:** **A:** 90-100, **B:** 80-89, **C:** 70-79, **D:** 60-69, **F:** below 60

**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.

**HOMEWORK:** Online Homework will be assigned online. The homework will count towards each one of the exam grades, except the final.

**ATTENDANCE:** Roll will be taken at the end of every class. Attendance is highly encouraged. Students are responsible for all material covered and/or distributed in class.

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

**WITHDRAWAL POLICY:** If you decide to withdraw from this course it is your responsibility to do so in order to receive a grade of “W”. Drop/withdrawals should be conducted through the office of the registrar. **A student who is absent three consecutive classes may be dropped from the class.**

**CLASSROOM BEHAVIOR:**

*Cellular phones must be turned off before class.* Taking a call in class or leaving class to do so is extremely rude and offensive.

*Please, be prompt.* Late arrivals are very disturbing for the instructor and disruptive to fellow students. You should plan to leave enough time to allow for traffic, parking, inclement weather, etc.

*Cheating.* Cheating will not be tolerated in this course. Any student caught will receive an automatic F in the course.

*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>MAC 1140</b>		<b>Spring 2010</b>
<b>Tentative Schedule</b>	<b>Date</b>	
<b>Week 1</b>		Introduction
		3.1, 3.2
<b>Week 2</b>		3.3, 3.4
		3.5, <b>Review</b>
<b>Week 3</b>		<b>Test 1 (ch 3)</b>
		5.1
<b>Week 4</b>		5.2, 5.3
		5.4, 5.5
<b>Week 5</b>		<b>Review</b>
		<b>Test 2 (ch 5)</b>
<b>Week 6</b>		6.1
		6.2, 6.3
<b>Week 7</b>		6.4, 6.5
		6.6
<b>Week 8</b>		6.7
		6.8
<b>Week 9</b>		<b>Review</b>
		<b>Test 3 (ch 6)</b>
<b>Week 10</b>		11.1
		11.2, 11.3
<b>Week 11</b>		11.4
		12.2, 12.6
<b>Week 12</b>		<b>Review</b>
		<b>Test 4 (ch 11, 12)</b>
<b>Week 13</b>		13.1
		13.2

<b>Week 14</b>		13.3, 13.4
<b>Week 15</b>		13.5
		<b>Review</b>
<b>Week 16</b>		<b>Test 5 (ch 13)</b>
		<b>Review</b>
<b>Week 17</b>		<b>FINAL</b>

## **MAC 1140 PRECALCULUS**

### **Course Competencies:**

**Competency 1:** The student will demonstrate an understanding of polynomial functions by

- a. analyzing the graph of a polynomial function, its behavior near its zeros and its end behavior.
- b. using the appropriate theorems of polynomials to factor a polynomial function and find all its zeros.
- c. stating the Fundamental Theorem of Algebra.
- d. using appropriate rules or theorems to determine the existence, location and classification of the zeros of a polynomial function.
- e. using the appropriate theorems of polynomials to build a polynomial function given its zeros or its graph.
- f. graphing polynomial functions.

**Competency 2:** The student will explore other algebraic functions by

- a. graphing transformations of a function given its graph or its equation.
- b. graphing piecewise functions that include nonlinear pieces.
- c. constructing and graphing functions that model real life applications and solving related problems.

**Competency 3:** The student will demonstrate an understanding of the conic sections by

- a. identifying them as the result of intersecting a plane with a cone.
- b. writing an equation for a parabola, ellipse or hyperbola in standard form given sufficient information about the conic.
- c. graphing a parabola, ellipse or hyperbola in standard form given sufficient information about the conic or given its equation.
- d. solving application problems involving parabolas, ellipses, and hyperbolas.

**Competency 4:** The student will demonstrate an understanding of sequences and series by

- a. defining sequences by using the general term or a recursive formula.
- b. classifying sequences as arithmetic, geometric or neither.
- c. adding the first  $n$  terms of a geometric or arithmetic sequence.
- d. using the summation notation properties to express and evaluate sums.
- e. finding the sum of a geometric series if it exists.
- f. proving a given statement is true using the principle of mathematical induction.
- g. solving application problems involving sequences.

**Competency 5:** The student will apply the Binomial Theorem

- a. to expand powers of a binomial.
- b. to find a particular coefficient or term.

**Competency 6:** The student will demonstrate an understanding of systems of equations by

- a. solving systems of three or more linear equations using matrices.
- b. solving systems of two nonlinear equations with two variables graphically and/or algebraically.

**Competency 7:** The student will demonstrate an understanding of exponential and logarithmic functions by

- a. identifying the domain of logarithmic and exponential functions.
- b. graphing logarithmic and exponential functions using transformations.
- c. solving equations involving logarithmic and exponential functions.
- d. using mathematical modeling to solve applications of logarithmic and exponential functions.

**Competency 8:** The student will demonstrate an understanding of rational functions by

- a. graphing rational functions which have asymptotes including vertical, horizontal and oblique.
- b. analyzing the behavior of the graph of a rational function about a point of discontinuity.
- c. analyzing the end behavior of the graph of a rational function in which the degree of the numerator is greater than the degree of the denominator plus one.

**Miami Dade College/InterAmerican Campus  
Mathematics Department**

**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. MAC1140, addresses outcomes 1, 2, 3, 4, 8.