



## COLLEGE ALGEBRA WITH MODELING

Revised 08/02/2010

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**COURSE NUMBER:** MAT 109

**PREREQUISITE(S):** MAT 102 or MAT 153 with grade of C or better, or placement.

**CO-REQUISITE(S):** None

**COURSE DESCRIPTIONS**

This course is an approach to algebra that incorporates mathematical modeling of real data and business applications. Emphasis on linear, quadratic, piece-wise defined, rational, polynomial, exponential and logarithmic functions. Includes inequalities and matrices.

**TEXTBOOK(S):** Blitzer, Robert. Algebra and Trigonometry, An Early Functions Approach, Upper Saddle River, New Jersey: Prentice Hall Publisher, 2007, 2<sup>nd</sup> Edition. ISBN-13: 978-0-321-58870-8

**REFERENCE(S):** N/A

**OTHER REQUIRED MATERIALS, TOOLS, AND EQUIPMENT:** TI-83 or TI-84 series graphing calculator. Calculators with algebraic symbolic operations are not allowed without instructor's approval.

**METHOD OF INSTRUCTION:** Concepts will be taught by lecture/demonstration and by group problem-solving. Student participation will be required. Audio-visual aids will be used when appropriate.

**GRADING SYSTEM:**

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

**GRADE CALCULATION METHOD:**

See instructor's handout.

## **ATTENDANCE POLICY:**

The student is responsible for punctual and regular attendance in all classes, laboratories, clinical, practica, internships, field trips, and other required class activities. The College does not grant excused absences; therefore, students are urged to reserve their absences for emergencies. When illness or other emergencies occur, the student is responsible for notifying instructors and completing missed work if approved for late submission by instructors.

### Mathematics Department Attendance and Participation Procedure for Lecture Classes:

- Attendance and participation in class is essential to the learning of mathematics.
- Students are expected to be in class, to be on time, and to stay for the entire class.
- Students are responsible for any missed work.
- Do not expect tutors, lab assistants and/or instructors to re-teach course content you miss. You need to have attempted the assigned materials before asking for help.

Instructors maintain attendance records. However, it is the student's responsibility to withdraw from a course. A student enrolling in and attending at least one course session remains enrolled until the student initiates a withdrawal.

Withdrawal Policy: During the first 75% of the course, a student may initiate withdrawal and receive a grade of W. A student cannot initiate a withdrawal during the last 25% of the course. Extenuating circumstances require documentation and approval by the appropriate department head and academic dean.

Absences for Religious Holidays: Students who are absent from class in order to observe religious holidays are responsible for the content of any activities missed and for the completion of assignments occurring during the period of absence. Students who anticipate their observance of religious holidays will cause them to be absent from class and do not wish such absences to penalize their status in class should adhere to the following guidelines:

1. Observance of religious holidays resulting in three or fewer consecutive absences: Discuss the situation

with the instructor and provide written notice at least one week prior to the absence(s). Develop (in writing) and instructor-approved plan which outlines the make up of activities and assignments.

2. Observances of religious holidays resulting in four or more consecutive absences: Discuss the situation with the instructor and provide the instructor with written notice within the first 10 days of the academic term. Develop an instructor-approved plan with outlines the make up of activities and assignments.

**CLASSROOM  
CONDUCT:**

**ACADEMIC DISHONESTY:** Students are expected to uphold the integrity of the College's standard of conduct, specifically in regards to academic honesty. All forms of academic dishonesty including, but not limited to, cheating on assignments/tests, plagiarism, collusion, and falsification of information will call for disciplinary action. Disciplinary action imposed may include one or more of the following: written reprimand, loss of credit for assignment/test, termination from course, and probation, suspension, or expulsion from the College. For further explanation of this and other conduct codes, please refer to the Student Handbook.

**CELLULAR PHONES AND PAGERS/BEEPERS:** Cellular phones, pagers and beepers are not permitted to be turned on or used within the classroom. Use of these devices during classroom time will be considered a violation of the student code as it relates to “disruptive behavior.”

**SCC MATHEMATICS DEPARTMENT POLICY**

**NO ELECTRONIC DEVICES WILL BE USED IN THE CLASSROOM WITHOUT PRIOR APPROVAL OF INSTRUCTOR.**

**Mathematics Departmental Procedure For Violation of Usage of electronic Devices:**

First time violation – Student will cut off electronic device (cell phone without answering it) and place the device on the instructor’s desk until the end of class. The instructor will remind the student of policy and procedure.

Subsequent violation – Student will cut off electronic device (cell phone without answering it) and place the electronic

device on the instructor's desk until the end of class. Student will be referred to the Chief Student Services Officer for disciplinary action and not allowed to return to class without written notification from the Chief Student Services Officer whose office is located in the Student Services Building.

**DAY EMERGENCY NUMBER  
RECORDS (864) 592-4681**

**EVENING EMERGENCY NUMBER  
EVENING SERVICES (AFTER 4:30 PM)  
(864)592-4830**

**CLASS/LAB  
PROCEDURES:**

N/A

**ACCOMMODATIONS:**

Students who need special accommodations in this class because of a documented disability should notify Student Disability Services. You may contact Student Disability Services by calling, (864) 592-4811, and toll-free-1-800-922-3679; via email through the Spartanburg Community College web site at [www.sccsc.edu/SDS/](http://www.sccsc.edu/SDS/); or by visiting the office located in the Dan Lee Terhune Student Services Building, room 112 of the Spartanburg Community College campus. By contacting Student Disability Services early in the semester, students with disabilities give the College an opportunity to provide necessary support services and appropriate accommodations.

**COURSE OUTCOMES &  
OBJECTIVES**

**Upon satisfactory completion of this course, the students should be able to demonstrate competency in the General Education Outcome listed as “their ability to express themselves effectively in quantitative and qualitative terms” in the following competencies and objectives:**

- I. Graph and Interpret Functions
  1. Solve and graph functions
  2. Interpret graphs
  3. Calculate and interpret slope
  4. Transform functions
  
- II. Model, Solve and Graph Equations
  1. Solve linear equations
  2. Solve rational equations
  3. Solve quadratic equations
  4. Model linear and quadratic functions from data
  
- III. Model, Solve and Graph Polynomial and Rational Functions
  1. Graph polynomial functions
  2. Graph rational functions
  3. Model polynomial and rational functions from data
  
- IV. Model, Solve and Graph Exponential and Logarithmic Functions
  1. Recognize exponential growth and decay
  2. Solve exponential and logarithmic functions
  3. Model exponential growth and decay from data
  4. Model logarithmic functions from data
  
- V. Model and Solve Systems of Equations
  1. Solve systems by graphing and by algebraic means
  2. Solve systems by matrices
  3. Model systems and solve by matrices.

**Syllabus Addendum**  
**MAT 109**  
**College Algebra with Modeling**

Algebra and Trigonometry, An Early Functions Approach, Blitzer, 2<sup>nd</sup> Edition  
Revised 08.05.2009

- I. Functions and Graphs
  - A. Section 1.1 Graphs and Graphing Utilities
  - B. Section 1.2 Basics of Functions and Their Graphs
  - C. Section 1.3 More on Functions and Their Graphs
  - D. Section 1.4 Linear Functions and Slope
  - E. Section 1.5 More on Slope
  - F. Section 1.6 Transformations of Functions
  - G. Section 1.7 Combinations of Functions; Composite Functions
  - H. Section 1.8 Inverse Functions
  
- II. Equations and Inequalities
  - A. Section 2.1 Linear Equations and Rational Equations
  - B. Section 2.2 Models and Applications
  - C. Section 2.3 Complex Numbers
  - D. Section 2.4 Quadratic Equations
  - E. Section 2.5 Other Types of Equations (Optional)
  
- III. Polynomial and Rational Functions
  - A. Section 3.1 Quadratic Functions
  - B. Section 3.2 Polynomial Functions
  - C. Section 3.7 Modeling Data with Linear and Quadratic Functions
  
- IV. Exponential and Logarithmic Functions
  - A. Section 4.1 Exponential Functions
  - B. Section 4.2 Logarithmic Functions
  - C. Section 4.3 Properties of Logarithms
  - D. Section 4.4 Exponential and Logarithmic Equations
  - E. Section 4.5 Modeling Data with Exponential and Logarithmic Functions
  
- V. Systems of Equations and Matrices
  - A. Section 8.1 Systems of Linear Equations in Two Variables with Modeling
  - B. Section 8.2 Systems of Linear Equations in Three Variables with Modeling
  - C. Section 9.1 Matrix Solutions to Linear Systems with Modeling
  - D. Section 9.2 Inconsistent and Dependent Systems (Optional)

**Homework Guide  
MAT 109  
College Algebra with Modeling**

Algebra and Trigonometry, An Early Functions Approach, Blitzer, 2<sup>nd</sup> Edition

Revised 08.05.2009

<b>Section Number</b>	<b>Page</b>	<b>Problem Guideline</b>
1.1	109	13 – 46 EOO (Every Other Odd), 55, 57, 59
1.2	125	1 – 91 EOO, 99 – 107 Odd
1.3	138	1 – 75 EOO, 83 – 97 Odd
1.4	154	1 – 71 EOO, 87 – 91 Odd
1.5	165	1 – 17 EOO, 25 – 29 Odd
1.6	181	1 – 117 EOO, 127
1.7	195	1 – 62 EOO
1.8	205	1 – 38 EOO
2.1	238	1 – 83 EOO, 91 – 97 Odd
2.2	251	1 – 53 EOO
2.3	260	1 – 55 EOO
2.4	276	1 – 109 EOO, 131 – 143 Odd
2.5	292	1 – 39 EOO, 41, 43
3.1	334	1 – 43 EOO, 57 – 67 Odd
3.2	348	1 – 71 EOO
3.7	411	1 – 35 EOO
4.1	430	1 – 55 EOO, 57 – 73 Odd
4.2	444	1 – 119 EOO
4.3	455	1 – 81 EOO
4.4	466	1 – 89 EOO
4.5	479	1 – 49 EOO
8.1	768	1 – 45 EOO
8.2	779	1 – 23 EOO
9.1	840	1 – 37 EOO
9.2	850	1 – 23 EOO, 25, 27, 29, 33, 35,

The odd problems have the answers in the back of the textbook.