

## **Salem Community College Course Syllabus**

**Course Title:** COLLEGE ALGEBRA ENHANCEMENT

**Course Code:** MAT 037

**Lecture Hours:** 3

**Lab Hours:** 0

**Credits:** 3

### **Course Description:**

This course is designed to help students to become proficient in analyzing linear, quadratic, polynomial, rational, exponential, and logarithmic functions. Students will also be able to solve both linear and nonlinear systems. Students will investigate topics both analytically and graphically. A TI-83 or 84 series graphing calculator is required. Credits do not apply toward graduation.

### **Prerequisites:**

College Placement Test or MAT092

### **Co-Requisite:**

MAT 137

### **Place in the College Curriculum:**

This course is required for students who have been identified as needing extra support in order to be successful in College Algebra and is taken concurrently with College Algebra. Credits do not apply toward graduation.

### **Date of Last Revision:**

April 2018

## **Course Content Outline:**

- I. Review of Algebraic Topics
- II. Linear equations
- II. Properties of lines
  - A. Slope
  - B. Find equation satisfying given conditions
  - C. Vertical and horizontal lines
  - D. Parallel and perpendicular lines
- III. Polynomials
  - A. Monomial arithmetic
  - B. Addition
  - C. Subtraction
  - D. Multiplication
- IV. Factoring
  - A. Greatest common factor
  - B. Grouping
  - C. Difference of squares
  - D. Trinomials
- V. Rational expressions
  - A. Reducing
  - B. Multiplication
  - C. Division
  - D. Addition
  - E. Subtraction
- VI. Radical expressions
  - A. Rational exponents
  - B. Simplifying
  - C. Multiplication and division
  - D. Addition and subtraction
  - F. Complex numbers
- VII. Exponentials
- VIII. Logarithms

**Course Performance Objective#1:** The student will analyze general functions.

**Learning Outcomes:**

- A. The student will find the domain of a linear or constant function.
- B. The student will find the domain of a polynomial function.
- C. The student will find the domain of a rational function.
- D. The student will find the domain of a radical function.
- E. The student will find the range of a linear function.
- F. The student will find the range of a quadratic function.
- G. The student will find the range of a rational function.

**Course Performance Objective #2:** The student will analyze linear inequalities.

**Learning Outcomes:**

- A. Given a linear inequality, the student will solve it analytically and graphically.
- B. Given a solution to an inequality, the student will write it using interval notation.
- C. Given a compound inequality using the word “and”, the student will solve it analytically and graphically and express the answer using interval notation.
- D. Given a compound inequality using the word “or”, the student will solve it analytically and graphically and express the answer using interval notation.
- E. Given a double inequality, the student will solve it analytically and graphically and express the answer using interval notation.

**Course Performance Objective #3:** The student will analyze linear functions.

**Learning Outcomes:**

- A. The student will find the slope of the line.
- B. The student will graph a straight line.
- C. The student will graph vertical and horizontal lines.
- D. The student will find the equation of the line using two points.
- E. The student will find the equation of the line using the slope and y-intercept.
- F. The student will find the equations of vertical and horizontal lines.
- G. The student will find the equation of the line perpendicular to a second line.
- H. The student will find the equation of the line parallel line to a second line.

**Performance Objective #4: The student will manipulate polynomials.**

**Learning Outcomes:**

- 1. Given an exponent problem, the student will use the “product”, “quotient”, “power”, “product to a power”, and “quotient to a power” rules correctly.
- 2. Given an exponent problem, the student will interpret a zero exponent and a negative exponent correctly.
- 3. Given a polynomial addition problem, the student will add correctly.
- 4. Given a polynomial subtraction problem, the student will subtract correctly.
- 5. Given a monomial and a polynomial, the student will be able to multiply correctly.
- 6. Given two polynomials, the student will multiply correctly.
- 7. Given a monomial and a polynomial, the student will divide correctly.

**Performance Objective #5: The student will completely factor polynomials.**

**Learning Outcomes:**

1. Given a polynomial, the student will identify and factor the greatest common factor from the polynomial.
2. Given a polynomial that can be factored by grouping, the student will factor.
3. Given a binomial that is a difference of squares, the student will factor.
4. Given a trinomial with a leading coefficient of one, the student will factor.

**Performance Objective #6: The student will simplify rational expressions.**

**Learning Outcomes:**

1. Given a rational expression, the student will reduce to lowest terms.
2. Given two or more rational expressions, the student will multiply and leave answer in lowest terms.
3. Given two rational expressions, the student will divide and leave answer in lowest terms.
4. Given two or more rational expressions, the student will add and leave answer in lowest terms.
5. Given two rational expressions, the student will subtract and leave answer in lowest terms.

**Performance Objective #7: The student will simplify radical expressions.**

**Learning Outcomes:**

1. Given an expression with rational exponents, the student will simplify using the properties of exponents.
2. Given a radical expression, the student will simplify.
3. Given two or more radical expressions, the student will multiply and/or divide and leave answers simplified.
4. Given a radical equation, the student will solve analytically and graphically and determine if any solutions are extraneous.
5. Given a complex number, the student will write in " $a + bi$ " form.
6. Given two complex numbers, the student will add and/or subtract.
7. Given two complex numbers, the student will multiply and/or divide.

**Course Performance Objective #6: The student will analyze exponential functions.**

**Learning Outcomes:**

- A. The student will find the domain and range of an exponential function.
- B. The student will find the horizontal asymptote of an exponential function.
- C. The student will sketch the graph of an exponential function.
- D. The student will solve exponential equations.
- E. The student will analyze an application problem using exponential function principals.

**Course Performance Objective #7: The student will analyze logarithmic functions.**

**Learning Outcomes:**

- A. The student will find the domain and range of a logarithmic function.
- B. The student will find the vertical asymptote of an exponential function.
- C. The student will sketch the graph of a logarithmic function.
- D. The student will solve logarithmic equations.
- E. The student will analyze an application problem using logarithmic function principals.

**General Education Requirements:**

The general education goals covered in MAT 037 are critical thinking & problem solving, quantitative skills, and science & technology. See student handbook for additional details.

**Outcomes Assessment:**

A college-wide outcomes assessment program has been put into place to enhance the quality and effectiveness of the curriculum and programs at Salem Community College. As part of this assessment program, the learning outcomes for this course will be assessed. Assessment methods may include tests, quizzes, papers, reports, projects and other instruments. Copies of all outcomes assessments are available in an electronic assessment bank maintained by the Institutional Research and Planning Office.

**Course Activities:**

Methods of instruction include lecture, group discussion, lab activities and graphical analysis on both the graphing calculator and the computer. The structure of the lab will be one of the following: a challenging problem set that the students work on collaboratively, a graphing calculator investigation or a computer experiment where the students investigate mathematics in an applied mode. The assignment(s)/activity students engage in to demonstrate their acquisition of the NJCCC GE Learning goal will be a mathematics lab activity.

**Course Requirements and Means of Evaluation:**

Please refer to the instructor's syllabus addendum (to be distributed in class) for specific information regarding the course requirements and means of evaluation.

**Attendance Policy:**

Regular and prompt attendance in all classes is expected of students. Students absent from class for any reason are responsible for making up any missed work. Faculty members establish an attendance policy for each course and it is the student's responsibility to honor and comply with that policy.

**Academic Honesty Policy:**

Students found to have committed an act of academic dishonesty may be subject to failure of this course, academic probation, and / or suspension from the college. See the Student Handbook for additional details.

**ADA Statement:** If you have a 504 Accommodation Plan, please discuss it with your instructor. If you have any disability but have not documented it with the Disability Support coordinator at Salem Community college, you must do so to be eligible for accommodations. To contact the Disability Support Coordinator, call 856-351-2773, or email [disabilitysupport@salemcc.edu](mailto:disabilitysupport@salemcc.edu) to set up an appointment. To find out more information about disability support services at Salem Community College, visit [www.salemcc.edu/students/student-success-programs/disability-support](http://www.salemcc.edu/students/student-success-programs/disability-support).

**Materials/Supplies:**

TI-83 or 84 series graphing calculator

**Additional Costs:**

As necessitated by the required materials.