

BROOME COMMUNITY COLLEGE  
Binghamton, New York

**COURSE TITLE** FOUNDATIONS FOR COLLEGE MATHEMATICS II MAT 092

**CLASS LECTURE HOURS** 4 **LAB HOURS** 0 **CREDIT HOURS** 0

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Designed to give the student proficiency in elementary mathematics **and** provide a firm foundation for credit courses.

Prerequisite: MAT 090 Foundations for College Mathematics I or equivalent.

### **MAT 092 Objectives**

After taking MAT 092 the student should be able to:

Perform skills in three categories: Algebra, Graphing and Problem Solving /Estimation.

Note: Throughout the course the students are expected to solve applied problems related to the topics of the course.

#### **Algebra:**

After taking MAT 092 the student should be able to:

1. Know and use order of operations effectively.
2. Solve linear equations.
3. Solve basic literal equations.
4. Solve algebraic proportions.
5. Perform operations with signed numbers.
6. Use exponent rules with integer exponents.
7. Solve linear systems by elimination.
8. Solve linear systems by substitution.
9. Add and subtract polynomials.
10. Multiply polynomials.
11. Divide polynomials by monomials.
12. Perform arithmetic operations with square roots. ( not algebraic expressions)
13. Simplify algebraic monomials inside a square root.
14. Add and subtract algebraic fractions with common denominators.
15. Multiply and divide algebraic fractions.
16. Factor a monomial from a polynomial.
17. Factor second degree polynomials.
18. Simplify rational expressions by factoring.
19. Solve quadratic equations by factoring.
20. Solve quadratic equations by using the quadratic formula.
21. Solve linear inequalities.

#### **Graphing:**

After taking MAT 092 the student should be able to:

22. Know the rectangular coordinate system.
23. Use the distance and the midpoint formulas.
24. Find the slope of a line.

25. Find the slope-intercept equation of a line
26. Find equations of vertical and horizontal lines.
27. Graph linear equations in two variables.
28. Solve linear systems by graphing.
29. Graph parabolas by plotting points and by using the intercepts.
30. Find the axis of symmetry of a parabola.
31. Graph solutions of linear inequalities.

### **Problem Solving/Estimation:**

After taking MAT 092 the student should be able to:

32. Solve problems using scientific notation.
33. Solve applications problems involving unit conversions.
34. Solve application problems using linear systems of equations.
35. Write mathematical notation that is consistently correct.
36. Describe in writing problem solving methods.
37. Work as a member of a team to solve problems.
38. Evaluate complicated formulas using a scientific calculator including complex fractions.
39. Use the formulas for area of standard quadrilaterals and triangle.
40. Use the formulas for area and circumference of a circle.
41. Use formulas for volume of a rectangular solid, a cylinder, and a sphere.
42. Solve applied problems.
43. Use estimation in problem solving.

### **CATALOG COURSE DESCRIPTION:**

Signed numbers, exponents and equations in one variable. Evaluating formulas and algebraic expressions. Factoring and the distributive property. Graphing, solving linear equations and inequalities in two variables. Area application.

Estimation, problem solving, critical thinking, writing, and communication skills are developed in group activities.

4 Class hours; Prerequisite: MAT 090 Foundations for College Mathematics I or equivalent.

**THIS COURSE NOT APPLICABLE TOWARD ANY DEGREES.**

MAT 092

Foundations for College Mathematics II

Course Outline

### Language of Algebra

- Fractions

- Decimals

- Percents

- Exponents

- order of operations

- Inequality

- operations on real numbers

- simplifying expressions

### Equations and Inequalities

- Solving linear equations

- Introduction to applied problems

- Formulas and geometric applications

- Percent, ratio and proportion

- Solving inequalities

### Polynomials

- Product rule and power rule for exponents

- Integer exponents and quotient rule

- Scientific notation

- Addition and subtraction of polynomials

- Multiplication of polynomials

### Graphing Linear Equations

- Linear equations in two variables

- Slope of a line

- Equations of lines

- Graphing linear equations in two variables

- Graphs of linear inequalities

### Systems of Linear Equations

- Solving systems of linear equations by graphing

- Solving systems of linear equations by addition

- Applications of linear systems

## Radicals

- Finding square roots

- Multiplication and division of square roots

## Factoring

- Factoring a monomial factor from a polynomial

- Factoring trinomials (Leading coefficient 1)

- Solving quadratics by factoring

## Quadratic Equations

- Solving quadratic equations by the quadratic formula