properties of real numbers; simplifying polynomial, rational, and radical expressions; solving linear, quadratic, rational, and radical equations in one variable; the rectangular coordinate system; graphing linear equations in two variables; and solving systems of linear equations in two variables. Applications of mathematical concepts. Equivalent to a first-year high school algebra course. Taught in a combined large lecture and laboratory format. Software used requires access to a computer with Windows operating system.
1. Solve a system of linear equations in two variables using the addition method.

2. Solve quadratic equations in one variable.

3. Add and simplify rational expressions.

4. Solve equations containing radical expressions involving one variable.

COURSE OBJECTIVES:
1. Identify the set of real numbers with the real number line and perform operations with real numbers.
2. Recognize and solve linear equations and quadratic equations in one variable.
3. Recognize and graph the solution set of linear equations in two variables and inequalities in one or two variables.
4. Recognize and solve a system of linear equations in two variables using the methods of graphing, substitution, and addition.
5. Perform operations on polynomials, including factoring and evaluating polynomials.
6. Perform operations on rational expressions and solve equations containing rational expressions.
7. Perform operations on radical expressions and solve equations containing radical expressions.
8. Translate, solve, and analyze application problems.

COURSE CONTENT:

LECTURE CONTENT:

A. Real Numbers
   1. Real Number Line
   2. Opposites
   3. Absolute Value
B. Operations on Real Numbers
   1. Addition
   2. Subtraction
   3. Multiplication
   4. Division
   5. Order of Operations
C. Properties of Real Numbers
   1. Properties of Addition
      a. Commutative Property
      b. Associative Property
      c. Additive Identity
      d. Additive Inverse Property
   2. Properties of Multiplication
      a. Commutative Property
      b. Associative Property
      c. Multiplicative Identity
      d. Multiplicative Inverse Property
   3. Distributive Property of Multiplication over Addition
   4. Multiplication and Division with Zero and One
D. Linear Equations in One Variable
   1. Properties of Equality
      a. Addition Property of Equality
      b. Multiplication Property of Equality
   2. Solving Linear Equations in One Variable
   3. Applications of Linear Equations in One Variable
E. Linear Inequalities in One Variable
1. Properties of Inequalities
   a. Addition Property of Inequality
   b. Multiplication Property of Inequality
2. Solving and Graphing Linear Inequalities and Compound Inequalities in One Variable

F. Linear Equations in Two Variables
   1. Rectangular Coordinate System
      a. Axes and Quadrants
      b. Graphing Ordered Pairs
   2. Solution Set of a Linear Equation in Two Variables
   3. Graphing Linear Equations in Two Variables
   4. Writing a Linear Equation in Two Variables

G. Linear Inequalities in Two Variables
   1. Solution Set of a Linear Inequality in Two Variables
   2. Graphing Linear Inequalities in Two Variables

H. Systems of Linear Equations in Two Variables
   1. Solution Set of a System of Linear Equations in Two Variables
   2. Solving Systems of Linear Equations in Two Variables
   3. Application of Systems of Linear Equations in Two Variables

I. Polynomials
   1. Properties of Exponents
   2. Operations on Polynomials
      a. Addition
      b. Subtraction
   3. Multiplication
   4. Division
   5. Factoring
   6. Evaluating a Polynomial

J. Quadratic Equations in One Variable
   1. Solving Quadratic Equations in One Variable
      a. Factoring and zero-product rule
      b. Square root property
      c. Completing the square
      d. Quadratic formula
   2. Applications of Quadratic Equations in One Variable

K. Rational Expressions
   1. Reducing Rational Expressions
   2. Operations on Rational Expressions
      a. Addition
      b. Subtraction
      c. Multiplication
      d. Division
   3. Solving Equations Containing Rational Expressions
   4. Applications of Rational Equations in One Variable
      a. Proportions
      b. Variation

L. Radical Expressions
   1. Simplifying Radical Expressions
      a. Square Roots
      b. Cube Roots
   2. Operations on Radical Expressions
      a. Addition
      b. Subtraction
      c. Multiplication
      d. Division
      e. Rationalizing Denominators
3. Solving Equations Containing Radical Expressions

LABORATORY CONTENT:

METHODS OF INSTRUCTION:

A. Lecture:
B. Lab:
C. Online:

INSTRUCTIONAL TECHNIQUES:

Lecture and/or Instruction

Laboratory assessment

COURSE ASSIGNMENTS:

Writing Assignments

Written computation processes for mathematical problems in the homework assignments and laboratory (computer) quizzes.

Out-of-class Assignments

Individual study that can be completed online through the online component of the course

METHODS OF STUDENT EVALUATION:

Midterm Exam
Final Exam
Short Quizzes
Written Assignments
Problem Solving Exercises

Demonstration of Critical Thinking:

Analysis and application of mathematical techniques presented in the course; mathematical modeling and computational methods.

Required Writing, Problem Solving, Skills Demonstration:

Homework, quizzes, and examinations covering topics presented in the course.

TEXTS, READINGS, AND RESOURCES:

TextBooks:


The textbook was updated to incorporate the online homework component for this course, as well as online quizzing done in the mathematics computer lab.

Software:


LIBRARY:

Adequate library resources include:

Comments:

Attachments:

Attached Files