Detailed Outline of Course Content

1. Introduction To Modeling

- Variable and constants
- Scattergrams
- Exact linear relationship
- Approximate linear relationships

2. Operations and Expressions

- Expressions
- Operations with fractions
- Adding real numbers
- Change in a quantity and subtracting real numbers
- Ratios, percents, and multiplying and dividing real numbers
- Exponents and order of operations

3. Using the Slope to Graph Linear Equations

- Graphing equations of the form $y = ax + b$
- Graphing linear models: Units analysis
- Slope of a line
- Using the slope to graph linear equations
- Rate of change

4. Simplifying Expressions and Solving Equations

- Commutative, associative, and distributive laws
- Simplifying expressions
- Solving linear equations in one variable
- Solving more linear equations in one variable
- Comparing expressions and equations
- Formulas

5. Linear Functions and Linear Inequalities in one variable

- Graphing linear equations
- Functions
- Function notation
- Finding linear equations
- Finding equations of linear models
- Using function notation with linear models to make estimates and predictions
- Solving linear inequalities in one variable

6. Systems of Linear Equations and Systems of Linear Inequalities

- Using Graphs and tables to solve systems
- Using substitution to solve system
- Using elimination to solve systems
- Perimeter, value, interest, and mixture problems
- Linear inequalities in two variables; Systems of linear inequalities in two variables.

7. Polynomial Functions and Properties of Exponents

- Adding and subtracting polynomial expressions and functions
- Multiplying polynomial expressions and functions
- Powers of polynomials; product of binomial conjugates
 - Properties of exponents

8. Factoring Polynomials and Solving Polynomial Equations

- Factoring trinomials of the form $x^2 + bx + c$ and difference of two squares
- Factoring out GCF; factoring by grouping
- Factoring trinomials of the form $ax^2 + bx + c$
- Sums and difference of cubes; a factoring strategy
- Using factoring to solve polynomial equations
- Using factoring to make predictions with quadratic models

12. Rational Functions

- Finding the domain of rational functions and simplifying rational expressions
- Multiplying and dividing rational expressions
- Adding and subtracting rational expressions
    1. Definition of the function, its domain and range. Graphs of constant and linear
        functions, their domain and range, x and y intercepts.