COURSE OUTLINE

MATH 100 - BEGINNING ALGEBRA

Prepared By: Mathematics Department
A. **TITLE:** BEGINNING ALGEBRA  

B. **COURSE NUMBER:** MATH 100  

C. **CREDIT HOURS:** 3  

D. **WRITING INTENSIVE COURSE:** N/A  

E. **COURSE LENGTH:** 15 weeks  

F. **SEMESTER(S) OFFERED:** Fall/Spring  

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:**  
   Three hours of lecture per week.  

H. **CATALOG DESCRIPTION:** This course is designed to prepare the student for Intermediate Algebra (MATH106). It assumes a limited algebra background at the secondary level. Topics include: a review of arithmetic operations, signed numbers, exponents, basic geometry concepts (such as angle measure, area and volume formulas), operations with polynomials, solving linear equations, introduction to graphing, and elementary word problems.  

I. **PRE-REQUISITES:** For students with no algebra background or for those receiving less than 75 on the New York State Math A or Integrated Algebra Regents or equivalent examination, or permission of instructor.  

J. **GOALS (STUDENT LEARNING OUTCOMES):**  
   By the end of this course, the student will be able to:  

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<tr>
<th>Course Objective</th>
<th>Institutional SLO</th>
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<tr>
<td>1. Demonstrate knowledge of arithmetic concepts and real number operations. Identify basic properties of the real number system.</td>
<td>Critical Thinking Communication</td>
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<td>2. Simplify algebraic expressions. Solve linear equations and simple inequalities. Write ratios and solve proportions.</td>
<td>Critical Thinking Communication</td>
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<td>3. Plot points and interpret graphs. Graph linear equations and find the slope of a line.</td>
<td>Critical Thinking Communication</td>
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<td>4. Evaluate formulas and transform literal equations. Translate English phrases into algebraic expressions and solve linear application problems.</td>
<td>Critical Thinking Communication</td>
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<td>5. Simplify expressions with integral exponents. Demonstrate knowledge of polynomials and perform basic operations.</td>
<td>Critical Thinking Communication</td>
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<td>6. Write the prime factorization of a number and factor polynomials. Solve quadratic equations and application problems by factoring.</td>
<td>Critical Thinking Communication</td>
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L. **REFERENCES:** Worksheets, software, video tapes, computer tutorials, and other texts are available on the network, in the Math Lab, and the Library.

M. **EQUIPMENT:** Smart classroom (computer projection and access to the internet).
   **NOTE:** Calculators will **not** be allowed in this course for tests and quizzes.

N. **GRADING METHOD:** A-F

O. **MEASUREMENT CRITERIA/METHODS:** Homework, quizzes, tests, and projects

P. **DETAILED COURSE OUTLINE:** See attached

Q. **LABORATORY OUTLINE:** None
I. Real Numbers
   A. Fractions, Decimals, and Percents
      1. Reducing
      2. Converting – mixed numbers, improper fractions
      3. Operations +, -, x, /
   B. The Real Number System
      1. Sets of numbers – names and structure
      2. Inequalities - relation between two real numbers (<, >, =)
   C. Signed Numbers
      1. Absolute Value
      2. Opposites
      3. Operations +, -, x, /
   D. Powers and Roots
   E. Order of Operations
      1. Evaluate algebraic expressions
   F. Properties of the Real Number System
      1. Identity, Inverse
      2. Commutative, Associative
      3. Distributive

II. Linear Equations and Inequalities
   A. Simplify Algebraic Expressions
      1. Remove Parentheses
      2. Combine Like Terms
   B. Solving Linear Equations (Using Inverse Operations)
      1. Determine whether a number is a solution to an equation
      2. Variable on Only One Side of the Equation
      3. Variable on Both Sides of the Equation
      4. Simplification and Equation Solving
   C. Ratios and Proportions
      1. Write ratios
      2. Solve Fractional Equations
   D. Solving Linear Inequalities
      1. Simple (not compound) – graph the solution on a number line

III. Graphing Linear Equations
   A. Reading Graphs
   B. The Cartesian Coordinate System
      1. Plot points
      2. State coordinates and quadrants
   C. Graphing Linear Equations
      1. Determine whether an ordered pair is a solution to a linear equation
      2. Point Plotting Method
      3. X- and Y-intercept Method
      4. Vertical and Horizontal Lines
   D. Slope of a Line
      1. Given two points
      2. Given a graph
      3. Given an equation
IV. Formulas and Applications of Algebra
   A. Formulas and Literal Equations
      1. Evaluate
      2. Solve for a specified variable
      3. Geometric: Perimeter, Area, Volume (square, rectangle, triangle, circle, and other figures if given formula)
   B. Translating (words to symbols)
      1. Write expressions involving percents
   C. Applications-Using Algebraic Models to Solve Word Problems
      1. Number Relation (consecutive integers)
      2. Geometry (perimeter, angles)
      3. Distance (Motion)
      4. Mixture (Dry) - coin, investment
      5. Average

V. Exponents and Polynomials
   A. Laws of Exponents (+, -, 0)
      1. Scientific Notation
   B. Types of Polynomials and Degree
   C. Addition and Subtraction of Polynomials
   D. Multiplication of Polynomials
      1. Two or More Monomials
      2. Distributive Property: (monomial) (polynomial)
      3. Two Binomials (F.O.I.L. and special products)
      4. Two Polynomials
   E. Division of Polynomials
      1. Short Division (divisor is a monomial)

VI. Factoring
   A. Prime Factorization of a Number
   B. Greatest Common Factor (GCF)
   C. Difference of Two Squares \( a^2 - b^2 \)
   D. Trinomials (using reverse of F.O.I.L.)
      1. Simple \( x^2 + bx + c \)
      2. General \( ax^2 + bx + c \)
   E. General Factoring Strategy (Factor Completely)
   F. Solve Quadratic Equations by Factoring
      1. Zero Product Rule
      2. Application Problems (rectangle-area, consecutive integers - product)