MATH IN THE URBAN SCHOOLS

Ma 604

Course Description

This course, designed primarily for in-service elementary urban school teachers, stresses the study of modern mathematics-its organization, its underlying psychological and philosophical principles, and creative teaching techniques important to the teacher of mathematics. Students are exposed to some of the significant research programs currently being undertaken by mathematics educators.

Course Content

I. Introduction to the course, course requirements; book and exercises.
   A. Solid figures – cube, tetrahedron, octahedron, dodecahedron; cone, cylinder
      a) Number, numeral, digit
      b) Sets, subset, disjoint sets, empty sets
      c) More than – less than

   B. Plane geometric shapes
   Draw the quadrilateral: 1. parallelogram, 2. trapezoid, 3. rhombus, rectangle, square, trapezium, perimeter, and area of the figures nomograph

II. Operation: Addition
   a) Commutative property, associative property, identity element
   b) Number line
   c) Operations with whole numbers
      1. Decimal numeral system properties of the number system; the number system; casting out nines (checking) primes and prime factors
      2. National numbers, least common multiple, least common denominator, prime factors-methodology
   d) Operations with integers
      1. Signed numbers on the number line; addition, subtraction, multiplication, and division, word problems
   e) Operations with fractions (equivalence)
   f) Operations with decimals
      1. Decimals and percent tables; fractions, magnitude of fractions, percents, practical applications
   g) Properties of Numbers
      1. Algebraic terms, polynomials – like and unlike terms
      2. Exponents, simplifying polynomials, operations with polynomials
   h) Order of operations
   i) GCF
   j) LCD
   k) Factoring
      1. composites

2. primes

l) Round off
m) Exponents
n) Linear equations and inequalities
    1. solving and checking linear equations
    2. solving and checking linear equations and fractions

III. Problem Solving
    a) Ratio and proportion
    b) Measurement
    c) Money application
    d) Probability and statistics
        1. tree combinations
        2. arrangements
        3. data gathering and organization
        4. analysis
    e) Time

IV. Tables And Graphs
    a) Circle
    b) Bar and double bar
    c) Line graph
    d) Problems with sports, etc.
    e) Temperature

V. Geometry
    a) Use of the compass and protractor
    b) Coordinates
    c) Solids (volume)
    d) Area and perimeter
        1. quadrilaterals
        2. triangles
    e) Circle
    f) Design and symmetry
    g) Congruence
    h) Vocabulary and terms

VI. Historical visits
    a) Roman Numerals
    b) Egyptian Numerals

VII. Introduction to Algebra
    a) Open sentences
    b) Equality and inequality

Evaluation Measures

1. Three written examinations. 30%
2. Written report on current research and plan to implement in the classroom. 20%
3. Presentation of lesson based on course content with appropriate use of technology. 20%
4. Comprehensive final examination. 30%

Bibliography

Required Text

McKeague, Charles P., Pre-Algebra. 5th Ed., Thomson Pub. Co., Belmont, CA 2005

Supporting Bibliography

Larson, Ron, Hostetler, Robert, and Hodgkins, Anne V., College Algebra Concepts and Models, 5th Ed., Houghton Mifflin Pub. Co., Boston MA 2006

Bennett, Jeffrey and Briggs, William, Mthematics a Quantitative Reasoning Approach. 3rd Ed., Pearson Pub. Co., Boston MA 2005

Barker, Vernon C., Aufmann, Richard N., and Lockwood, Joanne S., Essential Mathematics with Applications, 7th Ed., Houghton Mifflin Pub. Co., Boston MA 2006

Aufmann, Richard, Barker, Vernon C., Lockwood, Joanne S., Basic College Mathematics an Applied Approach, 8th Ed., Houghton Mifflin Pub. Co., Boston MA 2006