I. GENERAL DESCRIPTION
A. Approval Date
   December 2011
B. Department
   Mathematics
C. Course Number
   MATH 35
D. Course Title
   Prealgebra
E. Course Outline Preparer(s)
   Ni Peterkofsky, Fred Teti
F. Department Chair
   Dennis Piontkowski
G. Dean
   David Yee

II. COURSE SPECIFICS
A. Hours
   Lecture: 3 weekly (52.5 total)
   Conference: 2 weekly (35 total)
B. Units
   3
C. Prerequisites
   MATH E1 or MATH E3 or BSMA G; OR
   Placement into MATH 35 or into MATH 40
Corequisites
   None
Advisories
   None
D. Course Justification
   A developmental algebra course
   recommended for students who want
   additional preparation before taking
   Elementary Algebra or introductory courses
   in science, engineering technology, medical
   fields, or business.
E. Field Trips
   No
F. Method of Grading
   Letter
G. Repeatability
   0

III. CATALOG DESCRIPTION
Review of basic mathematics; measurement systems, length, area, volume, time, and unit
conversions; order of operations, signed numbers, integer exponents, square roots, simple
equations and formulas, proportions; calculator use, estimation, and number sense; introduction
to statistics and data charts; applications.

IV. MAJOR LEARNING OUTCOMES
Upon completion of this course a student will be able to:
A. Perform numerical calculations by hand and by calculator.
B. Demonstrate facility with units and unit conversion.
C. Classify applied problems by mathematical operation involved (e.g., addition for
   perimeters, multiplication for rectangular area).
D. Apply operation properties to simplify arithmetic and algebraic expressions.
E. Apply operation and equality properties to solve linear equations.
F. Translate applied problems into symbolic notation.
G. Solve problems modeled by linear equations (e.g., rate, mixture, perimeter).
H. Demonstrate the characteristics of an effective learner; in particular, complete assignments in a timely manner and apply study strategies that are reinforced in the classroom.

V. CONTENTS
A. Basic mathematics review
   1. Review of operations on whole numbers, fractions, and decimals
      a. Operations
      b. Finding unknown operands
      c. Translation of statements into symbols
      d. Use of number lines
   2. Number sense; estimation by rounding up, truncating, and rounding off; and calculator use
   3. Application problems involving whole numbers, fractions, decimals, or percents
B. Measurement and unit analysis
   1. Introduction to measurement and measurement systems, e.g., the metric system and others
   2. Introduction to and converting between lengths, areas, and volumes in both U.S. customary and metric units
   3. Mechanics of measuring length using ruler, yard/meter stick, and tape measure
   4. Unit conversion within and between measurement systems using unit analysis
   5. Application problems that require unit conversion
C. Introduction to statistics
   1. Chart interpretation and construction: tables, bar graphs, point graphs, line graphs, circle graphs (including an introduction to angle measure and protractors)
   2. Calculation and interpretation of measures of central tendency: mean, median, and mode
D. Order of operations and the integers
   1. Evaluation of numerical expressions in accordance with the order of operations
   2. Introduction to negative whole numbers and interpreting negative numbers in context as losses, debts, etc.
   3. Operations on integers and interpreting the results on a number line
      a. Addition, both of two numbers and of many numbers with mixed signs
      b. Absolute values and opposites
      c. Subtraction and its relationship with addition, absolute value, and negation
      d. Multiplication and division and the sign rules for these
   4. Operations on signed fractions and decimals
E. Introduction to variables, algebraic expressions, and formulas
   1. Representation of unknown quantities by variables
   2. Writing and interpretation of algebraic expressions
   3. Evaluation of algebraic expressions for given values of the variable(s), displaying results as a table and as a point graph
   4. Writing and interpretation of algebraic equations, including formulas
F. Powers and roots
   1. Interpretation of exponentiation with positive integer exponents as repeated multiplication
   2. Identification of the base and exponent in exponential expressions
3. Exponentiation with positive integer exponents
4. Evaluation of exponential expressions in accordance with the order of operations
5. Exponentiation with integer exponents
6. Use of the properties of exponentiation to simplify or re-write expressions
   a. Products of powers with the same base
   b. Quotients of powers with the same base
   c. Powers raised to powers
7. Conversion of numerals from decimal notation to scientific notation and vice versa
8. Introduction to square roots and radical notation
9. Approximate locations of irrational numbers on the number line
10. Evaluation of simple numerical expressions involving square roots both by hand and by calculator

G. Simplification and factorization of algebraic expressions
   1. Rearrangement of terms and factors
   2. Elimination of grouping symbols using the distributive property
   3. Factoring out a greatest common factor
   4. Combining like terms

H. Solving one-variable linear equations
   1. Determining whether a particular number is a solution of a given equation or inequality
   2. Solving equations with occurrences of the variable on only one side
      a. Solving equations that simplify to the form \( ax + b = c \) (\( a, b, \) and \( c \) integers)
      b. Solving equations that simplify to the form \( \frac{x + b}{a} = c \) (\( a, b, \) and \( c \) integers)
   3. Solving equations with occurrences of the variable on both sides of the equal sign
   4. Solving proportions

I. Use of algebraic equations or formulas to solve applied problems

VI. INSTRUCTIONAL METHODOLOGY
A. Assignments
   1. In-class discussion or small group work on calculations or problem solving
   2. Regular out-of-class reading assignments
   3. Regular homework that provides students with review and practice on the topics and procedures taught such as the arithmetic of integers, the order of operations, manipulation of simple exponential expressions, and applications of proportions

B. Evaluation
   1. Periodic tests and quizzes that assess each student's proficiency in topics from the current unit of coverage and include a mix of numerical calculation, graphical interpretation, symbolic manipulation, and verbal analysis
   2. Regular homework as described above
   3. Final examination that assesses each student's proficiency in key topics such as performing unit conversions, evaluating numerical expressions involving integers, and solving applied problems that involve simple linear equations

C. Textbooks and other instructional materials
   2. The Mathematics Department's textbook list indicates the current textbook
   3. Calculator
VII. TITLE 5 CLASSIFICATION
CREDIT/NON-DEGREE APPLICABLE (meets all standards of Title 5. Section 55002(b)).