COURSE TITLE: Pre-Algebra Mathematics

COURSE IDENTIFICATION: Math 22

CREDIT HOURS: 4

PREREQUISITES: “C” or better in Math 1ABCD or placement in Math 22

STUDENT LEARNING OUTCOMES:
Upon successful completion of Math 22, the student shall be capable of...
- Performing basic arithmetic operations on rational numbers
- Solving simple equations in one variable
- Manipulating simple algebraic expressions
- Meeting the demands of the next sequential math course

DEPARTMENT: Natural Science & Mathematics

INSTRUCTOR: James A. Schumaker

OFFICE LOCATION: EKH-225

OFFICE PHONE: (808) 934-2626

OFFICE HOURS: see current semester information

DATE: January 2013
COURSE DESCRIPTION:

Designed to prepare students for an elementary algebraic course as well as various technical math courses. Topics include: operations with integers and rational numbers, use of variables, algebraic expressions, the process of solving single- and multi-step equations, introduction to graphing linear equations, ratios, proportions, and percents. Optional topics may include geometry, mensuration, and polynomials.

Prerequisites: “C” or better in Math 1ABCD or placement in Math 22

COURSE OBJECTIVES:

To review arithmetic operations with Whole numbers and with Integers.
To review arithmetic operations with fractions and decimals.
To achieve an comprehensive understanding of percent, and its applications.
To develop an intermediate understanding of ratios, rates, proportions and their applications.
To achieve an fundamental understanding of informal geometry and units of measurement (U.S. Customary and Metric systems).
To acquire a basic understanding of descriptive statistics and pictographs.
To gain an introductory exposure to linear equations (one variable) and their solutions.
To acquire the ability to graph a linear equation (in two variables).
To gain an initial understanding of algebraic expressions and solving simple equations.

In addition, as in most mathematical courses, students will be presented with the challenge of utilizing critical thinking along with development of communicating their analyses in an ordered and neat fashion.

INSTRUCTIONAL MATERIALS:

Textbook: Prealgebra – Sixth Edition
by Martin L. Bittinger, David J. Ellenbogen & Barbara L. Johnson

Recommended: Student Solutions Manual (for the Bittinger, Ellenbogen & Johnson Prealgebra, 6th Ed. textbook);
A basic (inexpensive) calculator;
Graph paper or engineering pad;
A loose-leaf notebook for storing HomeWork, exams, and notes.
UNIT 1. Whole Numbers
Standard Notation; Addition; Subtraction; Multiplication; Division; Rounding and Estimating; Order; Solving Equations; Applications and Problem Solving; Exponential Notation and Order of Operations.

UNIT 2. Introduction to Integers and Algebraic Expressions
Integers and the Number Line; Addition of Integers; Subtraction of Integers; Multiplication of Integers; Division of Integers; Introduction to Algebra and Expressions; Like Terms and Perimeter.

UNIT 3. Fractional Notation: Multiplication and Division
Multiples and Divisibility; Factorization; Fractions; Multiplication; Simplifying; Multiplying, Simplifying, and More with Area; Reciprocals and Division; Solving Equations Using the Multiplication Principle.

UNIT 4. Fractional Notation: Addition, Subtraction and Mixed Numerals
Least Common Multiples; Addition, Order and Applications; Subtraction, Equations and Applications; Solving Equations Using the Principles Together; Mixed Numerals; Addition and Subtraction of Mixed Numerals (Applications); Multiplication and Division of Mixed Numerals (Applications); The Order of Operations and Complex Fractions

UNIT 5. Decimal Notation
Decimal Notation, Order and Rounding; Addition and Subtraction of Decimals; Multiplication of Decimals; Division of Decimals; Using Fraction Notation with Decimal Notation; Estimating; Solving Equations; Applications and Problem Solving.

UNIT 6. Introduction to Graphing and Statistics
Tables and Pictographs; Bar Graphs and Line Graphs; Ordered Pairs and Equations in Two Variables; Graphing Linear Equations; Means, Medians, and Modes; Predictions and Probability.
UNIT 7.  Ratio and Proportion
Introduction to Ratios; Rates and Unit Prices; Proportions; Applications of Proportions; Geometric Applications.

UNIT 8.  Percent Notation
Percent Notation; Solving Percent Problems Using Percent Equations; Solving Percent Problems Using Proportions; Applications of Percent; Sales Tax, Commission, and Discount; Simple and Compound Interest; Credit Cards.

UNIT 9.  Geometry and Measurement
Systems of Linear Measurement; Converting Units of Area; More with Perimeter and Area; Volume and Capacity; Angles and Triangles; Square Roots and the Pythagorean Theorem; Weight, Mass, and Temperature; Medical Applications.