CIP No. 33.0101

MATH 066
Alpha Number

Pre-Algebra
Course Title

Course Description
This course is a comprehensive study of foundational mathematical skills which should provide a strong mathematical underpinning for further study. Topics include principles and applications of decimals, fractions, the number line, ratio, signed operations, properties of operations, order of operations, numerical factoring, measurement, unit conversion, perimeter, and area. Upon completion, students should be able to perform fundamental computations and solve multi-step mathematical problems using the four problems solving steps in Polya's How To Solve It.

Course prepared by: Math Curriculum Committee March/2010

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<th>Hours per Week</th>
<th>Number of Weeks</th>
<th>Total Hours</th>
<th>Credits</th>
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<td>Seminar</td>
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Total Credit Hours 3

Purpose of Course: Degree Requirement
Degree Elective
Certification
Developmental X
Other

Prerequisite(s)

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Mary Van Ander
Signature, Curriculum & Assessment Committee Chairperson 1-4-2012

Ruth L. Abbott
Signature, Dean of Academic Affairs 1-4-2012

Signature, Vice President for Academic and Student Affairs 15/12

Last date reviewed or revised: March/2010
I. Pre-Algebra

II. Course Objectives

A. General Learning Outcomes
The student will:
1. Manipulate and conceptualize integers (DEV 1)
2. Manipulate and conceptualize rational numbers (DEV 1)
3. Conceptualize and create equivalences, using substitution (DEV 1)
4. Estimate, measure and calculate perimeters and areas (DEV 1)
5. Introduce and practice word problem applications with emphasis on understanding the problem through key words and making a plan to solve. (DEV 1)

B. Student Learning Outcomes

Upon completion of this course, the student will be able to:
1. Manipulate and conceptualize integers
   a. Add, subtract, multiply, divide, and apply whole number exponents to positive and negative integers
   b. Deconstruct integers into factors and construct integers from factors, including exponent notation
   c. Plot integers on the number line
   d. Introduce absolute value and distance on the number line
   e. Apply order of operations to simplify integer expressions
   f. Use knowledge of integers to interpret charts and graphs
2. Manipulate and conceptualize rational numbers
   a. Add, subtract, multiply, divide apply whole number exponents to signed fractions, mixed numbers, and decimals
   b. Compare fractions, mixed numbers, and decimals using manipulatives
   c. Plot rational numbers on the number line
   d. Apply properties of operations and order of operations to simplify rational number expressions
   e. Apply knowledge of rational numbers to interpret charts and graphs
   f. Introduce variable expressions
3. Conceptualize and create equivalences, using substitution
   a. Convert among fractions, decimals, and percents, demonstrating their position on the number line
   b. Use a single variable to stand for an unknown or varying quantity
   c. Create equivalent fractions
   d. Convert units within and between the English and Metric systems of measurement
4. Estimate, measure and calculate perimeters and areas
   a. Introduce perimeter (circumference for circle) as the distance around the figure
   b. Introduce area as the sum of unit squares
5. Introduce and practice word problem applications with emphasis on understanding the problem through key words and making a plan to solve.
   a. Translate English expressions into algebraic expressions using key words
   b. Translate algebraic expressions into English expressions using key words
   c. Represent the unknown and given information that relates to the unknown
III. Course Content

This course provides students with a thorough introduction and reinforcement of fundamental mathematical topics.

1. Arithmetic operations of addition, subtraction, multiplication, division, and power applied to whole numbers, fractions, decimals, and signed numbers
2. Conversion between and comparison of the forms of rational numbers
3. Decomposition of integers into their factors and the composition of integers from their factors
4. Interpret charts and graphs
5. Measurement of dimensions, quantification of perimeter and area, and conversion between units of measure
6. Introduction to problem solving strategies
7. Apply properties of operations, including order of operations, to simplify numeric and variable expressions

IV. Methods of Instruction

1. Class demonstrations
2. Cooperative groups activities with math manipulatives
3. Re-creation of historical settings in the development of numbers and arithmetic
4. Modeling and supervised class practice
5. Peer tutoring
6. Exploration via the internet

V. Equipment and Materials

1. Overhead projector
2. Manipulatives for fractions, decimals, ratios, percents, and signed numbers
3. Measuring Devices in metric and English units
4. Computer Software
5. Internet

VI. Suggested Methods of Evaluation

1. Participation
2. Assignments (homework, class work, projects)
3. Group work
4. Examinations

Letter grades for passing scores (C, C+, B, B+, A), NP for non passing grades.
# Course History Summary

**Course Number:** Math 060 Pre-Algebra (3cr)

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