MATH A008: PRE-ALGEBRA

Item	Value
Curriculum Committee Approval Date	12/02/2020
Top Code	170100 - Mathematics, General
Units	3 Total Units
Hours	54 Total Hours (Lecture Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Non-Degree Applicable (C)
Material Fee	No
Basic Skills	Basic Skills (B)
Repeatable	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)

Course Description

Pre-algebra will introduce basic operations of algebra including signed numbers, exponents, first degree equations, special products, applied problems, factoring, rational expressions, radicals, proportions, and the rectangular coordinate system. These topics will utilize the student's working knowledge of decimals, fractions, and percents. NOT DEGREE APPLICABLE. PREREQUISITE: MATH A005 or appropriate placement. Not Transferable.

Course Level Student Learning Outcome(s)

1. Perform operations on real numbers and algebraic expressions.
2. Evaluate and simplify algebraic expressions and solve linear equations of one variable.
3. Translate and solve real world application problems including ratios, rates, proportions, and percents.
4. Add, subtract, multiply and divide polynomials.
5. Determine the Greatest Common Factor of a given polynomial.
6. Translate real life problems into algebraic expressions or equations and simplify or solve using algebraic techniques.

Course Objectives

- 1. Simplify expressions involving integer exponents.
- 2. Use the order of operations on algebraic expressions.
- 3. Use the commutative, associative and distributive properties on algebraic expressions.
- 4. Find the prime factorization of whole numbers.
- 5. Solve linear equations.
- 6. Multiply algebraic binomial expressions.
- 7. Read, analyze, write equations, and solve application problems of basic algebra.
- 8. Find the common factor in an arithmetic or elementary algebraic expression.
- 9. Use the rectangular coordinate system to graph lines.
- 10. Simplify basic algebraic rational expressions.

Lecture Content

It is imperative that instructors cover all topics listed below in order to prepare the students for Math A010, the next course in this sequence, as well as other subsequent courses. The order in which topics are covered will be determined by the instructor and the text which is used. The scientific calculator may not be used in any chapters except those that cover solving equations, polynomials, and graphing on the rectangular coordinate plane. Introduction to Algebra understand integers and their relation on the number line perform addition and subtraction of integers perform multiplication and division of integers use order of operations on integers use rules of exponents in multiplying and dividing expressions with the same base simplify using the power rule of exponents simplify algebraic expressions with like terms multiplication of polynomials addition and subtraction of polynomials introduce the distributive property Equations use the distributive property with algebraic expressions use the addition, subtraction, multiplication, and division properties of equality solve basic linear equations in one variable perform rounding of numbers and estimation introduce applied problems that include writing variable expressions basic number problems geometric applications business applications evaluate formulas when given all but one of the unknown values find solution sets to linear equations in two variables understand the rectangular coordinate system find and plot ordered pairs of numbers graph basic equations of straight lines in two variables Fractions and Mixed Numbers review the properties of fractions factor using prime numbers understand the difference between factors and terms reduce fractional expressions to lowest terms perform multiplication and division of fractional expressions perform addition and subtraction of fractional expressions review mixed number and improper fraction notation use fractions in a combination of operations simplify complex fractional expressions use formulas involving fractions such as the area of triangle solve equations involving fractions Decimals review decimal notation and place value perform addition, subtraction, multiplication, and division of decimal expressions solve linear equations involving decimals Factoring find the greatest common factor in polynomials t is imperative that instructors cover all topics listed below in order to prepare the students for Math 010, the next course in this sequence, as well as other subsequent courses. The order in which topics are covered will be determined by the instructor and the text which is used. The scientific calculator may not be used in any chapters except those that cover solving equations, polynomials, and graphing on the rectangular coordinate plane. 1. Introduction to Algebra a. understand integers and their relation on the number line b. perform addition and subtraction of integers c. perform multiplication and division of integers d. use order of operations on integers e. use rules of exponents in multiplying and dividing expressions with the same base f. simplify using the power rule of exponents g. simplify algebraic expressions with like terms h. multiplication of polynomials i. addition and subtraction of polynomials j. introduce the distributive property 2. Equations a. use the distributive property with algebraic expressions b. use the addition, subtraction, multiplication, and division properties of equality c. solve basic linear equations in one variable d. perform rounding of numbers and estimation e. introduce applied problems that include writing variable expressions (1) basic number problems > (2) geometric applications (3) business applications f. evaluate formulas when given all but one of the unknown values g. find solution sets to linear equations in two variables h. understand the rectangular coordinate system i. find and plot ordered pairs of numbers j. graph basic equations of straight lines in two variables 3. Fractions and Mixed Numbers a. review the properties of fractions b. factor using prime numbers

Method(s) of Instruction

- Lecture (02)

Instructional Techniques

The primary mode of instruction is the lecture/demonstration method. Some sections are laboratory based using a variety of instructional methods including textbooks, video presentations, and computer based materials. Some sections may be taught using cooperative learning strategies.

Reading Assignments

Reading from assigned textbook. 1 hour

Writing Assignments

Writing is encouraged throughout the course but is not necessarily a part of the grading or exams. 1 hour

Out-of-class Assignments

Homework assignments, test preparation. 4 hours

Demonstration of Critical Thinking

Grades are determined by performance on quizzes and exams.
Some instructors may also include grades on homework, cooperative assignments, or cooperative learning sessions. A comprehensive final exam is part of this course.Critical thinking will be evaluated through a problem-solving approach. Writing is encouraged throughout the course but is not necessarily a part of the grading or exams.

Required Writing, Problem Solving, Skills Demonstration

Writing is encouraged throughout the course but is not necessarily a part of the grading or exams.

Textbooks Resources

1. Required Blair, Jamie, Jeffrey Slater and John Tobey. Prealgebra, 7th ed. Upper Saddle River: Pearson Education Inc, 2011

Other Resources

1. Student solution manuals or study guides 2. Tutorial software may be required.