# MTH 08 - PRE-ALGEBRA

## Course Description

This course provides a review of basic arithmetic skills. It begins by reviewing traditional by-hand calculations, including multiplication and long division. Integers are introduced (signed numbers) and then all operations are combined, including exponents and grouping symbols, using the correct order of operations. The concepts of prime factorization, LCM and GCD are introduced to lead in to fraction arithmetic. Fraction arithmetic includes addition, subtraction, multiplication, and division of fractions and mixed numbers as well as combined operations using the order of operations. Basic proportions and unit prices are used to solve problems. Decimals, and their relation to fractions, with both negative and positive signs are studied. All basic operations are applied to decimals. Then percentages and ratios and proportions are studied. We finish the course by learning about measurement systems and unit analysis, along with basic geometry including the Pythagorean Theorem. Every unit of study features applications as well as pure theory. By-hand calculations are taught and used at all levels.

## Credit Hours

4

## Contact Hours

4

## Lecture Hours

2

## Lab Hours

2

## Required Prerequisites

Placement into MTH 08

## Recommended Prerequisites or Skills Competencies

Basic arithmetic skills

## Course Learning Outcomes

**Knowledge:**

- Use operations of addition, subtraction, multiplication, division and exponentiation on the integers, fractions, and decimals.
- Distinguish mathematical vocabulary: whole number, integer, prime number, composite number, proper and improper fractions, rational and irrational numbers, absolute value, solve, simplify, squaring, square rooting, mean, median, mode averages.
- Use mathematical properties correctly (especially the Associative, Commutative, and Distributive properties of addition and multiplication).
- Describe the 'order of operations'.
- Use procedures for the following: tests for divisibility, prime factorization, finding all factor pairs for a number, finding the Least Common Multiple (LCM) and Greatest Common Factor (GCF), reducing and expanding fractions, reading and writing numbers in scientific notation, convert between decimals, fractions, and percent, finding a missing percent, amount or base in a percentage application, including interest and discount situations, set up

and solve a proportion in applications requiring them, set up and reduce rates and ratios, convert between and among metric units and common U.S. units, and Right triangle applications with the Pythagorean Theorem.
- Identify formulas and proper units of measurement for the perimeter, area, and volume of different geometric figures.

**Application:**

- Apply the appropriate procedure, operation(s), and 'order of operations', for problem solving as applied to written applications and math expressions.

**Integration:**

- Apply mathematical operations to indicated computation and application problems.

**Human Dimension:**

- Identify their mathematical strengths and weaknesses and strive to overcome their weaknesses.
- Collaborate with peers during group work.

**Caring - Civic Learning:**

- Recognize the impact mathematics plays in civic situations such as politics, education and income.

**Learning How to Learn:**

- Reflect on failure and take steps to improve and use their mathematical abilities to advance in related subjects.