

**MAT 101**  
**APPLIED MATHEMATICS I**

**COURSE DESCRIPTION:**

Prerequisites: MAT 060 or satisfactory score on placement test

Corequisites: None

This course is a comprehensive review of arithmetic with basic algebra designed to meet the needs of certificate and diploma programs. Topics include arithmetic and geometric skills used in measurement, ratio and proportion, exponents and roots, applications of percent, linear equations, formulas, and statistics. Upon completion, students should be able to solve practical problems in their specific areas of study. Also included are definitions and properties of angles, polygons, and circles; area; and right triangle trigonometry. *This course is intended for certificate and diploma programs.*  
Course Hours Per Week: Class, 2. Lab, 2. Semester Hours Credit, 3.

**LEARNING OUTCOMES:**

1. Students will be able to use arithmetic operations and algebraic techniques to manipulate and simplify expressions, solve equations, and to perform conversions between systems of measurement. Students will display proficiency by demonstrating the following competencies:
  - a. Perform operations with fractions.
  - b. Perform operations with decimals.
  - c. Change fractions to decimals and percents.
  - d. Change percents to decimals and fractions.
  - e. Solve applied problems involving percents.
  - f. Calculate ratios and solve proportions.
  - g. Solve applied problems using proportions.
  - h. Perform operations with measurement numbers.
  - i. Convert measurement numbers within the English and metric systems and between the two systems.
  - j. Perform operations with signed numbers.
  - k. Raise numbers to powers and find square roots of numbers.
  - l. Perform operations with algebraic expressions.
  - m. Solve equations and formulas.
  - n. Solve applied problems using algebraic techniques.
  - o. Convert numbers to scientific notation and convert from scientific notation to decimal form.
2. Students will be able to define, identify, and perform computations involving geometric figures and right triangle trigonometry. Students will display proficiency by demonstrating the following competencies:
  - a. Measure angles and determine relationships between angles.
  - b. Identify and find the area and perimeter of polygons.
  - c. Identify and find the area of triangles.
  - d. Use the Pythagorean Theorem.

- e. Identify the characteristics of a circle and find its circumference and area.
  - f. Find the values of trigonometric ratios using a calculator and from the given sides of a triangle.
  - g. Solve oblique triangles and right triangles.
  - h. Solve applied problems using trigonometry.
3. Students will be able to use descriptive statistics to summarize data. Students will display proficiency by demonstrating the following competencies:
- a. Read and construct statistical graphs.
  - b. Find the mean, median, and mode for sample data.

### **OUTLINE OF INSTRUCTION:**

- I. Review of fractions
  - A. Reducing to lowest terms
  - B. Comparing fractions
  - C. Multiplication
  - D. Division
  - E. Addition and subtraction
- II. Review of decimal numbers
  - A. Addition and subtraction
  - B. Multiplication and division
  - C. Changing fractions to decimals
  - D. Changing decimals to fractions
- III. Ratio and proportion
  - A. Calculating ratios
  - B. Solving proportions
  - C. Changing decimals to percent
  - D. Changing fractions to percent
  - E. Changing percents to decimal numbers
  - F. Applications of percent
- IV. Measurement
  - A. Addition and subtraction of measurement numbers
  - B. Multiplication and division of measurement numbers
  - C. Rounding
  - D. Unit conversions between the English and metric systems
- V. Signed numbers
  - A. Addition
  - B. Subtraction
  - C. Multiplication and Division
  - D. Exponents and square roots
- VI. Basic algebra
  - A. Signs and symbols

- B. Operations with algebraic expressions
  - C. Solving equations and formulas
  - D. Solving word problems
  - E. Scientific notation
- VII. Practical geometry
- A. Angle measurement
  - B. Area and perimeter of polygons
  - C. Pythagorean Theorem
  - D. Circles
- VIII. Right triangle trigonometry
- A. Angles and triangles
  - B. Trigonometric ratios
  - C. Solving right triangles
  - D. Oblique triangles
- IX. Statistics
- A. Reading and constructing graphs
  - B. Measures of central tendency

**REQUIRED TEXTBOOK AND MATERIALS:**

Carman, Robert A. and Hal M. Saunders. Mathematics for the Trades. 8th ed. Prentice Hall, 2008.

Scientific calculator

**STATEMENT FOR STUDENTS WITH DISABILITIES:**

Students who require academic accommodations due to any physical, psychological, or learning disability are encouraged to request assistance from a disability services counselor within the first two weeks of class. Likewise, students who potentially require emergency medical attention due to any chronic health condition are encouraged to disclose this information to a disability services counselor within the first two weeks of class. Counselors can be contacted by calling 536-7207, ext. 1413 or by visiting the Student Development Office in the Phail Wynn Jr. Student Services Center, room 1309.