J. Sargeant Reynolds Community College
Course Content Summary

Course Prefix and Number: MTH 111   Credits: 3

Course Title: Basic Technical Mathematics

Course Description:

Provides a foundation in mathematics with emphasis in arithmetic, unit conversion, basic algebra, geometry and trigonometry. This course is intended for CTE programs. Prerequisites: Competency in Introductory Algebra MDE 10 as demonstrated through placement or by satisfactorily completing MDE 10. Lecture 3 hours. Total 3 hours per week. 3 credits

General Course Purpose:

This course is intended for students who are in career and technical fields/degree programs requiring technical math components including trigonometry.

Course Prerequisites and Co-requisites:

Prerequisites: Competency in Introductory Algebra MDE 10 as demonstrated through placement or by satisfactorily completing MDE 10.

Student Learning Outcomes:
Upon completing the course, the student will be able to

1. Demonstrate basic skills in mathematics
    - Use a scientific calculator;
    - Round off numbers correctly;
    - Identify significant digits;
    - Use scientific notation;
    - Convert between units in both standard and metric;
    - Perform operations with signed numbers;

2. Demonstrate knowledge of basic algebra
    - Apply and interpret ratio and proportion;
    - Compute values in direct, indirect, and inverse variation;
    - Solve single variable equations;
    - Locate and plot points on the *xy* plane;
    - Interpret the concept of slope using real world examples (including vertical and horizontal lines);
    - Graph lines using a table of values with and without the domain provided;
    - Graph lines using the slope-intercept method when lines are in $y = mx + b$ form and $Ax + By = C$ form;
    - Write the equation of a line in slope-intercept form that models a real world situation when given the rate of change and initial value;
    - Make predictions using the equation of a line;

3. Demonstrate knowledge of geometry
    - Classify triangles by their sides/angles;

- Calculate the perimeter and circumference;
- Calculate the area of a polygon and circle;

- Apply concepts of sector and arc length of a circle;
- Recognize various geometric solids such as cylinder, cone, pyramid, prism, and sphere;
- Calculate surface area and volume of various geometric solids;
- Use the properties of inscribed and circumscribed polygons and circles to find unknown amounts;
- Apply the concept of similar triangles;
- Apply the Pythagorean theorem;
- Convert between decimal degrees and DMS notation;
- Interpret and apply line and angle relationships;

4. Demonstrate knowledge of trigonometry
   - Properly use terms related to an angle(s);
   - Define the trigonometric functions and their values;
   - Solve right triangles and their applications;
   - Identify the signs of the trigonometric function of angles greater than 90º; and
   - Determine trigonometric functions of any angle.

Major Topics to Be Included:

- Basic Skills
- Basic Algebra
- Geometry
- Trigonometry

Effective Date/Updated: May 1, 2023