

**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. Replaces MTH 101 or 103 or 104 or 105 or 106. Prerequisites: Competency in Math Essentials (MTE) 1-3 as demonstrated through the placement and diagnostic tests or by satisfactorily completing the required MTE units or equivalent or MCR 1. Lecture 3 hours per week.

General Course Purpose: 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 Math Essentials (MTE) 1-3 as demonstrated through the placement and diagnostic tests or by satisfactorily completing the required MTE units or equivalent or MCR 1.

Course Objectives:

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 90° ; and
 - Determine trigonometric functions of any angle.

Major Topics to Be Included:

1. Basic Skills
2. Basic Algebra
3. Geometry
4. Trigonometry

Effective Date of Course Content Summary: August 8, 2017