Course Prefix and Number: MTH 111

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