J. Sargeant Reynolds Community College
Course Content Summary

Course Prefix and Number: MTH 131 **Credits:** 3

Course Title: Technical Mathematics

Course Description: Presents algebra through unit conversion, trigonometry, vectors, geometry, and complex numbers. Prerequisites: competency in MTE 1-6. Lecture 3 hours per week.

General Course Purpose: Students entering degree programs in Engineering Design Technology (CAD), Electrical/Instrumentation/Electronics (EIE), Machine Technology, and similar fields will benefit from this course.

Course Prerequisites and Co-requisites:
Prerequisites: Competency in MTE 1-6

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

1. Demonstrate basic skills
   - Use a scientific calculator;
   - Round off numbers correctly;
   - Identify significant digits;
   - Use scientific and engineering notation;
   - Convert between units in both standard and metric;
   - Compute basic algebra;

2. Demonstrate an understanding of geometry
   - Apply and interpret line and angle relationships;
   - Classify triangles by their sides/angles;
   - Calculate the perimeter of a polygon;
   - Calculate the circumference and chord length on a circle;
   - Calculate the area of a polygon;
   - Calculate the area of a circle;
   - Apply concepts of sector and arc length of a circle;
   - Recognize various geometric solids, such as cylinder, cone, pyramid, prism, sphere, and conic sections;
   - Calculate surface area and volume of various geometric solids;
   - Apply the concept of similar triangles;

3. Demonstrate an understanding of trigonometry
   - Properly use terms related to an angle(s);
   - Classify triangles by their sides/angles;
   - Apply the radian as a measure of an angle, convert between degrees and radians;
   - 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^{o};
- Determine trigonometric functions of any angle;

4. Demonstrate an understanding of vectors
   - Describe vectors and their components;
   - Solve applications involving vectors;
   - Perform addition and scalar multiplication with vectors;

5. Demonstrate an understanding of complex numbers
   - Interpret complex numbers and perform basic operations;
   - Convert between forms of rectangular and polar complex numbers; and
   - Perform basic operations with polar complex numbers.

Major Topics to Be Included:

1. Basic Skills
2. Geometry
3. Trigonometry
4. Vectors
5. Complex Numbers

Date Created/Updated (Month, Day, and Year)**:** July 18, 2019