

**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. Replaces MTH 115 and MTH 116. Prerequisites: 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: MTE 1-6

Course Objectives:

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° ;
 - 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

Effective Date of Course Content Summary: August 8, 2017