

**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. 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:

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 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
 - 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:

- Basic Skills
- Geometry
- Trigonometry
- Vectors
- Complex Numbers

Effective Date/Updated: May 1, 2023