

**SOUTHEAST COMMUNITY COLLEGE
DIVISION OF ARTS AND SCIENCES**

Mathematics

Revision Date: 07-01-22

[Syllabus Statements](#)

I. CATALOG DESCRIPTION

Course Number: MATH1020
Course Title: Technical Mathematics
Prerequisite(s): A grade of "C" or higher in MATH0900 or a grade of "B" or higher in MATH0903 or appropriate score on math placement test.
Catalog Description: This course provides the math skills required in career/technical fields. The course includes a review of arithmetic operations, ratios and proportions, algebraic operations, geometrical relationships and right triangle trigonometry with emphasis placed on applications.
Credit Hours: 3.0
Class Hours: 45
Lab Hours: 0
Total Contact Hours: 45

II. COURSE OBJECTIVES: *Course will:*

- A. Apply arithmetic properties.
- B. Apply measurement concepts to real-world applications.
- C. Apply ratios and proportions to problem-solving for technical applications.
- D. Apply formula manipulation and evaluation for problem solving for unknown values.
- E. Apply geometric formulas and concepts to problem solving of technical applications.
- F. Apply right triangle relationships to problem solving of technical applications.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES

- A. Student Learning Outcomes: *Student will be able to:*
 - 1. Apply arithmetic to technical applications.
 - 2. Find and convert measurements.
 - 3. Compare quantities in ratio form and by solving both direct and inverse proportions.
 - 4. Analyze and manipulate formulas for problems with unknown values.
 - 5. Identify and apply perimeter, area, and volume formulas for two-dimensional and three-dimensional figures.
 - 6. Solve right triangles.
- B. General Education Learning Outcomes
 - 1. GELO #5: Analytical, Quantitative, and Scientific Reasoning
 - Outcome: Apply mathematical and scientific methods to solve problems from an array of contexts and everyday situations.
 - Outcome: Develop strategies, algorithms, or experiments (or perform experiments) to describe the systems or solve problems.
 - 2. GELO #3: Critical Thinking & Problem Solving
 - Outcome: Collect, identify, interpret, and analyze data
 - Outcome: Synthesize information to arrive at reasoned solutions
 - Outcome: Evaluate the validity of arguments, alternatives, data, outcomes, and/or impact of actions

- IV. CONTENT/TOPICAL OUTLINE** (*course outline may provide more detailed information*)
- A. Arithmetic**
 - 1. Review of operations with whole numbers, fractions, and decimals with a focus on applications
 - 2. With and without technology
 - B. Percent**
 - 1. Convert between fractions, decimals, and percents
 - 2. Solve percent problems for base, percent, or amount given two of the quantities
 - 3. Apply percents to real world applications, ie. sales tax, discount, tolerance, commission
 - C. Ratios, Rates, Inverse and Direct Proportions**
 - 1. Translate and simplify an application by using rates and ratios
 - 2. Solve application problems using inverse or direct proportions
 - D. Measurement Systems**
 - 1. Metric to metric conversions for length, area, volume, and weight.
The minimum expectation is that the metric prefixes from kilo- to milli- are memorized.
 - 2. English to English conversions for length, area, volume, and weight
 - 3. Metric to English conversions, and vice versa, for length, area, volume, and weight
 - E. Significant Digits, Precision, Accuracy**
 - 1. Identify the precision and accuracy of measurement numbers
 - 2. Round calculations to the appropriate precision or accuracy
 - F. Measuring Tools**
 - 1. Measure and read a variety of tools which could include the ruler, tape measure, caliper, and micrometer.
 - G. Scientific Notation**
 - 1. Convert between standard notation and scientific notation
 - 2. Multiply and divide numbers in scientific notation
 - H. Exponential Notation and Square Roots**
 - 1. Evaluate a number raised to an exponent
 - 2. Evaluate square roots
 - I. Integers**
 - 1. Perform operations with and without technology
 - J. Order of Operations**
 - 1. Include square roots and exponents
 - K. Algebra**
 - 1. Translate an English phrase to a mathematical equation
 - 2. Isolate a variable in an equation or a formula
 - 3. Solve one and two-step equations
 - 4. Apply formulas to practical situations
 - L. Geometry**
 - 1. Classify angles
 - 2. Measure angles with a protractor
 - 3. Determine the value of angles in relationship with a transversal
 - 4. Identify polygons, ie. triangles, quadrilaterals, pentagons, hexagons
 - 5. Calculate area and perimeter of basic shapes, ie. squares, rectangles, parallelograms, triangles, circles
 - 6. Calculate volume of basic solids, ie. prisms, cylinders, spheres
 - 7. Calculate the area and volume of irregular shapes consisting of the basic shapes

Note: A reference sheet with formulas will be provided.
 - M. Right Triangle Trigonometry**
 - 1. Apply the Pythagorean Theorem.
 - 2. Find the sine, cosine, and tangent of an angle.
 - 3. Solve right triangles for all sides and angles.
 - 4. Solve real world applications involving right triangles.

Note: Definitions of the sine, cosine, and tangent ratios are to be memorized.

V. INSTRUCTIONAL MATERIALS

- A. Required Text(s): check with instructor to determine which of the following text will be required for your course.
 - 1. Saunders & Carman, *Mathematics for the Trades*, 10th Ed.
 - 2. *Elementary Technical Mathematics*, 11th Ed., Cengage.
 - 3. Program-specific books – i.e. Northeast drafting book.
- B. Other Resources:
 - 1. Measuring tools or online simulators (tape measure, micrometer, caliper, and other measuring tools)
 - 2. Scientific calculator

VI. METHODS OF PRESENTATION/INSTRUCTION

- A. Methods of instruction typically include a combination of the following:
 - 1. Lecture.
 - 2. Small group discussion.
 - 3. Speaker presentation.
 - 4. Online/hybrid.
 - 5. Engaged Learning Experience activities.
 - 6. Lab setting.
 - 7. Modular

VII. METHODS OF EVALUATION

- A. Methods of evaluation typically include a combination of the following:
 - 1. Unit tests
 - 2. Comprehensive final exam
 - 3. Quizzes
 - 4. Assignments – written, hands-on application, and/or MyLab and/or WebAssign
- B. SCC GRADING SCALE

A+	95-100	C+	75-79	F	59 or less
A	90-94	C	70-74		
B+	85-89	D+	65-69		
B	80-84	D	60-64		