SOUTHEAST COMMUNITY COLLEGE
DIVISION OF ARTS AND SCIENCES
Mathematics
Revision Date: 07-01-21
Syllabus Statements

I. CATALOG DESCRIPTION

Course Number:	MATH1020
Course Title:	Technical Mathematics
Prerequisite(s):	A grade of "C" or higher in MATH0950 or a grade of "B" or higher in MATH0953 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: Effectively develop strategies, algorithms, or experiments (or performing experiments) to better describe the systems or to solve the problems.

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):
- **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 MyLabPlus 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		