Columbus State Community College
Math Department

Course and Number: Mathematics for Engineering Technologies MATH 1115

CREDITS: 4 CLASS HOURS PER WEEK: 5 (3 lecture, 2 lab)
PREREQUISITES: MATH 1024 with a C or better, or placement equivalent.

DESCRIPTION OF COURSE (AS IT APPEARS IN THE COLLEGE CATALOG):
This college level mathematics course is designed for students seeking degrees in Mechanical Engineering Technology, Electric Engineering Technology, and Electro-Mechanical Engineering Technology. Topics include: mathematics of measurement, function concepts and representations, basic elementary functions, right angle trigonometry, vectors, and mathematical modeling.

All topics are delivered in the engineering context of Mechanical Engineering Technology(MECH), Electric Engineering Technology(EET), and Electro-Mechanical Engineering Technology(EMEC). This course focuses on building problem solving and critical thinking skills and the supporting algebraic and analytical skills. Labs are included to support and extend the course topics. This course fulfills the mathematics requirement for designated AAS degree programs at CSCC. Transfer credit is not guaranteed.

LEARNING OUTCOMES:

Unit 1: Measurement

1.1: What is Measurement?
- Students will learn about measurements including units of rates and quantities.

1.2: Precision and Accuracy
- Students will learn about precision and accuracy and how these are applied.

1.3: Unit Conversions/Dimensional Analysis
- Students will learn how to apply the concepts and skills of dimensional analysis.

Unit 2: Geometry of Shapes

2.1: Angles
- Students will learn various measurement systems for angles.

2.2: Geometry of Triangles
- Students will learn about the geometric structure of triangles.

Unit 3: Functions

3.1: Introduction to Functions
- Students will learn the basic concepts and definition of functions.

3.2: Interpreting Graphs and Tables
- Students will learn how to use functional representations to analyze properties of functions.

3.3: Creating Graphs and Tables

- Students will learn how to create graphs of functions by hand and with technology.

3.4: Using Formulas

- Students will learn how functional values are modeled with formulas.

Unit 4: Relationships

4.1: Types of Relationships

- Students will learn about independent and dependent relationships and how these are modeled with graphs, tables, and formulas.

4.2: Equations of Relationships

- Students will learn how functional values are modeled with equations.

4.3: Modeling

- Students will learn how to model real situations with equations and functions.

Unit 5: Right Triangle Trigonometry

5.1: Properties of Triangles

- Students will learn basic trigonometry questions leading the way to functional relationships.

5.2: Pythagorean Theorem

- Students will learn how to apply the Pythagorean Theorem to deconstruct a triangle.

5.3: Trigonometric Functions

- Students will learn the basic trigonometric functions.

5.4: Approximating Trigonometric Functions

- Students will learn how to use technology to approximate trigonometric values.

5.5: Solving Triangles

- Students will learn to completely describe triangle measurements.

5.6: Applications

- Students will learn to apply trigonometric reasoning to real situations.

Unit 6: Vectors

6.1: Introduction to Vectors

- Students will learn the basic structure of vectors.

6.2: Representation of Vectors

- Students will learn about the various representation systems for vectors.

6.3: Vector Arithmetic

- Students will learn the arithmetic of vectors.

6.4: Applications

- Students will learn to apply vector reasoning to real situations.

GENERAL EDUCATION GOALS:
Columbus State Community College has defined a series of general education outcomes that all students are expected to acquire before they graduate which include:

- Critical Thinking
- Quantitative Literacy

EQUIPMENT AND MATERIAL REQUIRED:

- Scientific Calculator

TEXTBOOK, MANUALS, REFERENCES, AND OTHER READINGS:

- All materials provided

GENERAL INSTRUCTIONAL METHODS:
Instructional methods may include face-to-face or video lectures or demonstration, face-to-face or virtual discussion, individual or group activities including the use of visual aids, graphing calculators, computers and/or other technologies. Students may be expected to participate in these activities during class and/or outside of class. Instructors may require class participation, collaborative learning, and peer review.

ASSESSMENT:
Columbus State Community College is committed to assessment (measurement) of student achievement of academic outcomes. This process addresses the issues of what you need to learn in your program of study and if you are learning what you need to learn. The assessment program at Columbus State has four specific and interrelated purposes: (1) to improve student academic achievements; (2) to improve teaching strategies; (3) to document successes and identify opportunities for program improvement; (4) to provide evidence for institutional effectiveness. In class you are assessed and graded on your achievement of the outcomes for this course. You may also be required to participate in broader assessment activities.

STANDARDS AND METHODS FOR EVALUATION
This course utilizes a variety of assessment methods including, but not limited or restricted to: exercises, labs, quizzes, tests, exams, and projects.

GRADING SCALE:
90% - 100% = A
80% - 89% = B
70% - 79% = C
60% - 69% = D
0% - 59% = E