EASTERN ARIZONA COLLEGE
Technical Math
Course Design
2010-2011

Course Information

Division	Mathematics
Course Number	TEC 102
Title	Technical Math
Credits	4
Developed by	Ray Orr
Lecture/Lab Ratio	4 Lecture/0 Lab

Transfer Status

ASU	NAU	UA
Non Transferable	Elective Credit	Non Transferable

Activity Course	No
CIP Code	48.0500
Assessment Mode	Pre/Post Test (20 Questions/100 Points)
Semester Taught	Spring
GE Category	AAS degree only
Separate Lab	No
Awareness Course	No
Intensive Writing Course	No

Prerequisites

MAT 120 with a grade of "C" or higher

Educational Value

To provide technical mathematical preparation for future education and employment.

Description

An introduction to functions including error analysis, analytical and numerical trigonometry, systems of linear equations, vector algebra, and three dimensional geometry. Using mathematics and a scientific calculator or computer software to solve technical problems is emphasized.

Supplies

Scientific Calculator

Competencies and Performance Standards

1. Demonstrate understanding of the real number system.

Learning objectives

What you will learn as you master the competency:

a. Round off numbers.

b. Determine precision.

c. Determine accuracy.

d. Calculate error and percentage error.

e. Convert between standard notation and scientific notation.

Performance Standards

Competence will be demonstrated:

- in written tests and examinations.

Performance will be satisfactory when:

- you can demonstrate an understanding of the real number system.

2. Demonstrate the ability to use the basic algebraic concepts to simplify and solve.

Learning objectives

What you will learn as you master the competency:

a. Apply the rules for simplifying polynomial expressions.

b. Apply the rules for simplifying radical expressions.

c. Solve linear equations.

d. Translate a word problem into an algebraic equation or equations.

Performance Standards

Competence will be demonstrated:

- in written tests and examinations.

Performance will be satisfactory when:

- you can demonstrate the ability to use basic algebraic concepts to solve and simplify.

3. Demonstrate the ability to use geometric formulas to find perimeter, area, and volume.

Learning objectives

What you will learn as you master the competency:

a. Use formulas to find perimeter.

b. Use formulas to find area.

c. Use formulas to find volume.

d. Use formulas to find surface area.

Performance Standards

Competence will be demonstrated:

- in written tests and examinations.

Performance will be satisfactory when:

- you can demonstrate the ability to use formulas to find perimeter, area, surface area, and volume.

4. Demonstrate understanding of functions and ability to plot the graphs of various functions.

Learning objectives

What you will learn as you master the competency:

a. Distinguish between functions and non-functions.

b. Determine domain and range of functions.

c. Use function notation.

d. Use the basic operations with functions: addition, subtraction, multiplication, division, and composition.

e. Sketch the graphs of a variety of basic algebraic functions.

f. Sketch the graphs of a variety of basic trigonometric functions.

Performance Standards

Competence will be demonstrated:

- in written tests and examinations.

Performance will be satisfactory when:

- you can demonstrate an understanding of functions and the ability to graph various functions.

5. Demonstrate the ability to solve systems of linear equations.

Learning objectives

What you will learn as you master the competency:

a. Solve systems of equations by graphing.

b. Solve systems of equations by substitution.

c. Solve systems of equations by addition.

d. Solve systems of equations using Cramer's Rule.

Performance Standards

Competence will be demonstrated:

- in written tests and examinations.

Performance will be satisfactory when:

- you can demonstrate the ability to solve systems of linear equations.

6. Demonstrate understanding of and the ability to use angles and solve triangle problems.

Learning objectives

What you will learn as you master the competency:

a. Convert radians to degrees and degrees to radians.
b. Solve right triangles problems.
c. Determine the reference angle.
d. Define the six basic trigonometric functions.
e. Determine the six basic trigonometric functions for any given angle.
f. Determine an angle by using inverse trigonometric functions.
g. Use the law of sines to solve problems.
h. Use the law of cosines to solve problems.

Performance Standards

Competence will be demonstrated:

- in written tests and examinations.

Performance will be satisfactory when:

- you can demonstrate an understanding of angles and the ability to solve problems involving triangles.

7. Demonstrate understanding of and the ability to use vectors to solve problems.

Learning objectives

What you will learn as you master the competency:

a. Determine the horizontal and vertical components of a vector
b. Add vectors using components.
c. Use vectors to solve application problems.

Performance Standards

Competence will be demonstrated:

- in written tests and examinations.

Performance will be satisfactory when:

- you can demonstrates understanding of and the ability to use vectors to solve problems

Types of Instruction

Classroom Presentation

Grading Information

Grading Rationale

Each instructor has the flexibility to develop evaluative procedures within the following parameters.

1. Written Exams must represent at least 60% of the final course grade.
2. Final Exam must represent at least 20% of the final course grade.
3. The Post Test is to be embedded in the final exam and must represent at least 10% of the final course grade.
4. Other Activities may represent at most 20% of the final course grade.

Grading Scale

A 90%-100%

B 80%-89%

C 70%-79%

D 60%-69%

F Below 60%