South Central College

MATH 1050  Mathematics for Technical Careers

Course Outcome Summary

Course Information

Description
This course develops a number of mathematical tools required of various technical fields. It covers certain applied aspects of algebra, trigonometry and geometry. More specifically, you will learn how to solve linear and quadratic equations and systems of linear equations, evaluate and use the six trigonometric functions in computing triangle results, and apply geometric concepts to the measurement of both two-dimensional and three-dimensional objects.

Total Credits 3
Total Hours 48

Types of Instruction

Instruction Type Credits/Hours
Classroom Presentation

Pre/Corequisites

A score of at least 56 on the Arithmetic portion of the Accuplacer test.

Institutional Core Competencies

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

Course Competencies

1. Express algebraic concepts accurately in symbolic form
   Learning Objectives
   Identify the eleven fundamental properties of real number operations
   Contrast exact solutions with calculator solutions
   Express numbers using scientific notation
   Evaluate expressions containing exponents and radicals

2. Manipulate algebraic expressions according to the properties of real numbers
   Learning Objectives
   Combine algebraic expressions using the four fundamental operators
   Solve linear equations
Model real-world problems with algebraic equations

3. **Visualize key geometric figures and relationships**
   Learning Objectives
   Express linear relationships geometrically
   Express equivalencies (if any) between pairs of angles

4. **Compute geometric quantities**
   Learning Objectives
   Calculate area and perimeter of triangles
   Calculate area and perimeter of quadrilaterals
   Calculate the circumference of a circle and the area bounded by it
   Measure the area bounded by irregular figures
   Compute the volume of certain solid geometric figures

5. **Define the function concept clearly and accurately**
   Learning Objectives
   Express the functional relationship of two sets of data
   Contrast relations with functions

6. **Visualize a function by its graph**
   Learning Objectives
   Translate algebraic notions to geometric in the Cartesian plane
   Graph simple functions

7. **Derive the six trigonometric functions from triangle considerations**
   Learning Objectives
   Define angle measurement
   Extend angle measurement to fractions of a degree
   Convert between decimal degrees and degrees/minutes/seconds
   Define the trigonometric functions in terms of plane triangles
   Find exact trigonometric values for common angles

8. **Solve right triangle problems using trigonometry**
   Learning Objectives
   Model real-world problems using right triangles
   Solving the missing parts in such problems using trigonometry

9. **Generalize methods for solving simultaneous linear equations**
   Learning Objectives
   Visualize linear equations geometrically
   Solve systems of two equations in two unknowns
   Solve systems of three equations in three unknowns

10. **Factor algebraic expressions**
    Learning Objectives
    Recognize the difference of two squares
    Recognize the square of a binomial
    Recognize the difference of two cubes
    Factor trinomials by grouping

11. **Expand algebraic expressions**
    Learning Objectives
    Multiply rational expressions
    Divide rational expressions
    Add rational expressions
    Subtract rational expressions
    Solve equations involving rational expressions
12. **Solve quadratic equations**  
Learning Objectives  
Solve quadratic equations by factoring  
Solve quadratic equations by completing the square  
Solve quadratic equations by quadratic formula

13. **Model real-world behavior of quadratics functions**  
Learning Objectives  
Compute the maximum or minimum of a quadratic over an interval  
Find intervals of increasing or decreasing behavior  
Find the axis of symmetry and intercepts  
Graph quadratic functions using parts (a) through (c)

14. **Extend the trigonometric functions to circles**  
Learning Objectives  
Determine the signs of the trigonometric functions over their domains  
Define the trigonometric functions for any angle

15. **Model real-world problems with radian measurement of angles**  
Learning Objectives  
Define the radian  
Convert between radian and degree measurement  
Apply radian measure to real-world problems

16. **Define vectors and vector algebra**  
Learning Objectives  
Express a vector graphically  
Express a vector algebraically

17. **Combine vectors to create sums**  
Learning Objectives  
Add two vectors graphically  
Add two vectors algebraically  
Find the difference of two vectors  
Solve applications modeled by vectors

18. **Apply trigonometry to oblique triangles**  
Learning Objectives  
Find the remaining parts of a triangle using the Law of sines  
Find the remaining parts of a triangle using the Law of cosines

**SCC Accessibility Statement**  
South Central College strives to make all learning experiences as accessible as possible. If you have a disability and need accommodations for access to this class, contact the Academic Support Center to request and discuss accommodations. North Mankato: Room B-132, (507) 389-7222; Faribault: Room A-116, (507) 332-7222.

Additional information and forms can be found at: [www.southcentral.edu/disability](http://www.southcentral.edu/disability)

This material can be made available in alternative formats by contacting the Academic Support Center at 507-389-7222.