



Lakeshore Technical College

## 31-462-318 Trades Math Industrial Maintenance 2

### Course Outcome Summary

#### Course Information

<b>Description</b>	...provides the learner with the necessary skills to use scientific calculators for the application of pre-algebra, algebra, geometry, and trigonometry. The course is self-paced, open entry/exit, and designed for individualized student needs.
<b>Total Credits</b>	1
<b>Total Hours</b>	36

#### Pre/Corequisites

Prerequisite 31-462-317 Trades Math Industrial Maintenance 1

#### Course Competencies

##### 1. Solve equations by rearrangement, using the principles of equality.

###### Linked Core Abilities

Apply learning  
Demonstrate critical thinking  
Demonstrate responsible and professional workplace behaviors  
Use mathematics effectively

###### Linked Program Outcomes

Communicate technical information

###### Assessment Strategies

- 1.1. Written Assignment
- 1.2. Written Test

###### Criteria

*Your performance will be successful when:*

- 1.1. learner submits the assignment.
- 1.2. you can solve equations by rearrangement, using the principles of equality.
- 1.3. learner completes the unit test.

###### Learning Objectives

- 1.a. Perform individual operations of addition, subtraction, multiplication, division, powers, and roots with decimals using a calculator.
- 1.b. Express word problems as equations.
- 1.c. Solve simple equations using logical reasoning.
- 1.d. Solve equations involving the principles of equality.
- 1.e. Rearrange formulas in terms of any letter value.
- 1.f. Substitute values in formulas and solve.

1.g. Solve direct and inverse proportions.

## 2. Solve problems involving lines and angular measure.

### Linked Core Abilities

Apply learning

Demonstrate critical thinking

Demonstrate responsible and professional workplace behaviors

Use mathematics effectively

### Linked Program Outcomes

Communicate technical information

### Assessment Strategies

2.1. Written Assignment

2.2. Written Test

### Criteria

*Your performance will be successful when:*

- 2.1. learner submits the assignment.
- 2.2. you can solve angles and sides of triangles.
- 2.3. learner completes the unit test.

### Learning Objectives

- 2.a. Solve problems that involve combinations of roots with other basic arithmetic operations.
- 2.b. Solve problems consisting of combinations of operations by applying the order of operations.
- 2.c. Perform individual operations of addition, subtraction, multiplication, division, powers, and roots with decimals using a calculator.
- 2.d. Add, subtract, multiply, and divide angles in terms of degrees, minutes, and seconds.
- 2.e. Express decimal degrees as degrees, minutes, and seconds.
- 2.f. Express degrees, minutes, and seconds as decimal degrees.
- 2.g. Compute compliments and supplements of angles.
- 2.h. Identify different types of angles.
- 2.i. Determine unknown angles in geometric figures using the principles of opposite, alternate interior, corresponding, parallel, and perpendicular angles.
- 2.j. Identify different types of triangles.
- 2.k. Determine the unknown angles based on the principles that all triangles contain 180 degrees.
- 2.l. Identify corresponding parts of triangles.
- 2.m. Compute angles and sides of isosceles, equilateral, and right triangles.
- 2.n. Determine interior angles of any polygon.

## 3. Solve right triangles problems using trigonometry.

### Linked Core Abilities

Apply learning

Demonstrate critical thinking

Demonstrate responsible and professional workplace behaviors

Use mathematics effectively

### Linked Program Outcomes

Communicate technical information

### Assessment Strategies

3.1. Skillbuilder Exercise

3.2. Written Test

### Criteria

*Your performance will be successful when:*

- 3.1. learner submits the assignment.
- 3.2. you can solve the functions of angles.
- 3.3. learner completes the unit test.

### Learning Objectives

- 3.a. Identify the sides of a right angle triangle with reference to any angle.
- 3.b. State the ratios of the six trigonometric functions in relation to given triangles.
- 3.c. Find functions of angles given in decimal degrees and degrees, minutes, and seconds.
- 3.d. Find angles in decimal degrees and degrees, minutes, and seconds.
- 3.e. Compute an unknown angle of a right triangle when two sides are known.
- 3.f. Compute an unknown side of a right triangle when an angle and a side are known.
- 3.g. Identify different types of triangles.
- 3.h. Determine unknown angles based on the principle that all triangles contain 180 degrees.
- 3.i. Identify corresponding parts of triangles.
- 3.j. Identify similar triangles and compute unknown angles and sides.
- 3.k. Compute angles and sides of isosceles, equilateral, and right triangles.
- 3.l. Determine interior angles of any polygon.

#### 4. Solve geometry problems for area and volume.

##### Linked Core Abilities

Apply learning  
 Demonstrate critical thinking  
 Demonstrate responsible and professional workplace behaviors  
 Use mathematics effectively

##### Linked Program Outcomes

Communicate technical information

##### Assessment Strategies

- 4.1. Written Assignment
- 4.2. Written Objective Test

##### Criteria

*Your performance will be successful when:*

- 4.1. learner can solve area and volume problems
- 4.2. learner submits written assignment

##### Learning Objectives

- 4.a. Express decimal degrees as degrees, minutes, and seconds.
- 4.b. Express degrees, minutes, and seconds as decimal degrees.
- 4.c. Convert between customary and metric area measures.
- 4.d. Compute areas, lengths, and widths of rectangles.
- 4.e. Compute areas, bases, and heights of parallelograms.
- 4.f. Compute areas, both bases, and heights of trapezoids.
- 4.g. Compute areas of complex figures containing two or more common polygons
- 4.h. Compute areas of triangles given the base and height.
- 4.i. Compute areas of triangles given three sides.
- 4.j. Compute bases, and heights given triangle areas.
- 4.k. Compute areas, radii, and diameters of circles.
- 4.l. Compute the areas, radii, and central angles of sectors.
- 4.m. Compute areas of segments.
- 4.n. Compute the volume of prisms and cylinders.
- 4.o. Compute heights and base areas of prisms and cylinders.
- 4.p. Compute weights of prisms and cylinders.
- 4.q. Compute volumes of pyramids and cones.
- 4.r. Compute heights, bases, and weights of pyramids and cones.
- 4.s. Compute volumes of frustums of pyramids and cones.
- 4.t. Compute heights, bases, and weights of frustums of pyramids and cones.
- 4.u. Compute volumes of spheres.
- 4.v. Compute capacities and weights of spheres.

#### 5. Solve simple practical machine application problems.

##### Linked Core Abilities

Apply learning  
 Demonstrate critical thinking  
 Demonstrate responsible and professional workplace behaviors

Use mathematics effectively

**Linked Program Outcomes**

Communicate technical information

**Assessment Strategies**

- 5.1. Skillbuilder Exercise
- 5.2. Written Test

**Criteria**

*Your performance will be successful when:*

- 5.1. learner submits the assignment.
- 5.2. you can solve practical right triangle problems with applied trigonometry.
- 5.3. learner completes the unit test.

**Learning Objectives**

- 5.a. Solve simple machine technology problems that require the projection of auxiliary lines and the use of geometric principles and trigonometric functions.

**6. Solve oblique triangles.**

**Linked Core Abilities**

Apply learning  
Demonstrate critical thinking  
Demonstrate responsible and professional workplace behaviors  
Use mathematics effectively

**Linked Program Outcomes**

Communicate technical information

**Assessment Strategies**

- 6.1. Written Assignment
- 6.2. Written Objective Test

**Criteria**

*Your performance will be successful when:*

- 6.1. learner can solve oblique triangle problems
- 6.2. learner submits written assignment

**Learning Objectives**

- 6.a. Solve simple oblique triangles using the Law of Sines and the Law Cosines.
- 6.b. Solve practical shop problems by applying the Law of Sines and the Law of Cosines.