



Lakeshore Technical College

# 31-462-317 Trades Math Industrial Maintenance 1

## Course Outcome Summary

### Course Information

<b>Description</b>	...prepares the learner to use scientific calculators for the applications of common fraction and mixed number problems, decimal problems, inch and metric conversion problems, basic percentage problems, powers and roots, and pre-algebra problems. This course is self-paced when delivered in the evening.
<b>Total Credits</b>	1
<b>Total Hours</b>	36

### Types of Instruction

Instruction Type	Credits/Hours
Lecture	1/36

### Textbooks

*Mathematics for Machine Technology*, **Author:** Smith & Peterson **Edition:** 7th **ISBN:** 1133281450. **Source:** LTC Bookstore. (required)

### Learner Supplies

LTC Machine Tool Operations - Math Study Guide. **Source:** Blackboard Course. (required)

LTC Math & Print Course Guidelines **Source:** Blackboard Course. (required)

Scientific Calculator fx-115MS Plus -SR. **Manufacturer:** Casio. **Source:** LTC Bookstore (required)

Access to a computer with internet connectivity

### Course Competencies

#### 1. Solve common fraction and mixed number problems.

##### Assessment Strategies

- 1.1. Skillbuilder Exercise
- 1.2. Written Test

##### Criteria

*Your performance will be successful when:*

- 1.1. learner submits the assignment.
- 1.2. you can solve common fraction and mixed number problems.
- 1.3. learner completes the unit test.

##### Learning Objectives

- 1.a. Express fractions in lowest terms.
- 1.b. Express fractions as equivalent fractions.
- 1.c. Express mixed numbers as improper fractions.
- 1.d. Express improper fractions as mixed numbers.
- 1.e. Determine lowest common denominators.
- 1.f. Add fractions and mixed numbers.
- 1.g. Subtract fractions.
- 1.h. Subtract mixed numbers.
- 1.i. Multiply fractions and mixed numbers.
- 1.j. Divide by common fractions (cancellation).
- 1.k. Divide fractions and mixed numbers.
- 1.l. Solve problems that involve combined operations of fractions and mixed numbers.
- 1.m. Perform combinations of operations with fractions using a calculator.

## 2. Solve decimal fractions problems.

### Assessment Strategies

- 2.1. Skillbuilder Exercise
- 2.2. Written Test

### Criteria

*Your performance will be successful when:*

- 2.1. learner submits the assignment.
- 2.2. you can solve decimal fraction problems.
- 2.3. learner completes the unit test.

### Learning Objectives

- 2.a. Express common fractions having denominators of powers of ten as equivalent fractions.
- 2.b. Write decimal numbers in word form.
- 2.c. Write numbers expressed in word form as decimal fractions.
- 2.d. Round decimal fractions to any required number of places.
- 2.e. Convert common fractions to decimal fractions.
- 2.f. Convert decimal fractions to common fractions.
- 2.g. Add and subtract decimal fractions.
- 2.h. Add and subtract combinations of decimals, mixed decimals, and whole numbers.
- 2.i. Multiply and divide decimal fractions.
- 2.j. Multiply and divide combinations of decimals, mixed decimals, and whole numbers.
- 2.k. Write decimal or fraction equivalents using a decimal equivalent table.
- 2.l. Determine nearer fraction equivalents of decimals by using the decimal equivalents table.
- 2.m. Perform combination of operations with decimals using a calculator.

## 3. Solve powers and root problems.

### 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 power and root problems.
- 3.3. learner completes the unit test.

### Learning Objectives

- 3.a. Raise numbers to indicated power.
- 3.b. Solve problems that involve combinations of powers with other basic operations
- 3.c. Extract whole number roots.
- 3.d. Solve problems that involve combinations of roots with other basic arithmetic operations.
- 3.e. Solve problems consisting of combinations of operations by applying the order of operations.
- 3.f. Perform individual operations of addition, subtraction, multiplication, division, powers, and roots with decimals using a calculator.

#### **4. Solve basic percentage problems.**

##### **Assessment Strategies**

- 4.1. Skillbuilder Exercise
- 4.2. Written Test

##### **Criteria**

*Your performance will be successful when:*

- 4.1. learner submits the assignment.
- 4.2. you can solve basic percentage problems.
- 4.3. learner completes the unit test.

##### **Learning Objectives**

- 4.a. Express decimal fractions and common fractions as percent.
- 4.b. Express percent as decimal fractions and common fractions.
- 4.c. Determine the percentage, given the base and rate.
- 4.d. Solve simple and complex percentage practical applications in which two of the three parts are given.

#### **5. Convert Inch and Metric units.**

##### **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 convert inch and metric units.
- 5.3. learner completes the unit test.

##### **Learning Objectives**

- 5.a. Express customary lengths as larger or smaller customary linear units.
- 5.b. Express metric lengths as larger or smaller metric linear units.
- 5.c. Express metric length units as customary length units.
- 5.d. Express customary length units as metric length units.
- 5.e. Determine the degree of precision of and given number.
- 5.f. Compute total tolerance and maximum and minimum limits of dimensions.
- 5.g. Compute maximum and minimum clearance and interference of mating parts.
- 5.h. Express unilateral tolerances as bilateral tolerances.

#### **6. Interpret measurement scales for linear measuring tools.**

##### **Assessment Strategies**

- 6.1. Skillbuilder Exercise
- 6.2. Written Test

##### **Criteria**

*Your performance will be successful when:*

- 6.1. learner submits the assignment.
- 6.2. you can read common measurement scales.
- 6.3. learner completes the unit test.

##### **Learning Objectives**

- 6.a. Read measurements on fractional-inch and decimal-inch steel rules.
- 6.b. Read measurements on metric steel rules.
- 6.c. Measure lengths using fractional-inch, decimal-inch, and metric scales.
- 6.d. Read measurements set on a decimal-inch vernier caliper and vernier height gage.
- 6.e. Read settings from the barrel and thimble scales of a 0.001- inch micrometer.
- 6.f. Read settings from the barrel, thimble, and vernier scales of a 0.0001- inch micrometer.
- 6.g. Determine proper gage block combinations for specified customary or metric system dimensions.

#### **7. Interpret symbols used in algebraic expressions.**

### **Assessment Strategies**

- 7.1. Skillbuilder Exercise
- 7.2. Written Test

### **Criteria**

*Your performance will be successful when:*

- 7.1. learner submits the assignment.
- 7.2. you can solve basic algebraic equations.
- 7.3. learner completes the unit test.

### **Learning Objectives**

- 7.a. Express word statements as algebraic expressions.
- 7.b. Express diagram dimensions as algebraic expressions.
- 7.c. Evaluate algebraic expressions by substituting numbers for symbols.
- 7.d. Compare signed numbers according to size and direction using the number scale.
- 7.e. Determine absolute values of signed numbers.
- 7.f. Perform basic operations of addition, subtraction, multiplication, and division, powers, and roots using signed numbers.
- 7.g. Solve expressions that involve combined operations of signed numbers.

## **8. Solve algebraic operations of addition, subtraction, and multiplication.**

### **Assessment Strategies**

- 8.1. Skillbuilder Exercise
- 8.2. Written Test

### **Criteria**

*Your performance will be successful when:*

- 8.1. learner submits the assignment.
- 8.2. you can solve addition, subtraction, multiplication and division equations.
- 8.3. learner completes the unit test.

### **Learning Objectives**

- 8.a. Perform basic algebraic operations of addition, subtraction, and multiplication.
- 8.b. Express decimal numbers in scientific notation form and multiply and divide using scientific notation.
- 8.c. Perform the basic algebraic operations of division, powers, and roots.
- 8.d. Simplify algebraic expressions that involve combined operations.