



Western Technical College

## 10420105 Machining for Maintenance

### Course Outcome Summary

#### Course Information

<b>Description</b>	This course is a basic introduction to machining and machine tool concepts for industrial maintenance personnel. Fundamental lathe, mill and drill processes will be covered along with layout skills and tool usage in a hands-on lab environment.
<b>Career Cluster</b>	Manufacturing
<b>Instructional Level</b>	Associate Degree Courses
<b>Total Credits</b>	3
<b>Total Hours</b>	72

#### Textbooks

No textbook required.

#### Learner Supplies

Safety glasses with side eye protection that meet Z87 OSHA guidelines. **Vendor:** Campus Shop. Required.

Proper work boots - \$35.00-75.00. **Vendor:** To be discussed in class. Required.

Scientific calculator (recommend T1-36x Solar). **Vendor:** Campus Shop. Required.

Three-ring binder. **Vendor:** Campus Shop. Required.

Clipboard. **Vendor:** Campus Shop. Required.

Pens/Pencils. **Vendor:** Campus Shop. Required.

## Course Competencies

### 1. Demonstrate use of personal protective equipment.

#### Assessment Strategies

- 1.1. Demonstrate use of personal protective equipment.
- 1.2. Written Objective Test

#### Criteria

- 1.1. you wear all PPE correctly.
- 1.2. you identify PPE requirements for various situations.
- 1.3. you identify unsafe clothing.
- 1.4. you complete all related quiz and test questions.

#### Learning Objectives

- 1.a. Describe dress code for an industrial setting.
- 1.b. Identify proper PPE for a given situation/process.
- 1.c. Explain proper use of PPE.
- 1.d. Ascertain PPE requirements from SDS(MSDS) information.

### 2. Use proper terminology when referring to measurements, measurement principles and measuring tools.

#### Learning Objectives

- 2.a. Describe physical shapes and properties of three dimensional objects and features according to accepted engineering practices.
- 2.b. Identify measuring tools.

### 3. Select and apply measuring tools to meet application requirements.

#### Learning Objectives

- 3.a. Recognize difference between English and metric measurements.
- 3.b. Convert English and metric measurements from one system to the other.
- 3.c. Recognize limits of discrimination for measuring tools.

### 4. Characterize various metals and their properties as they relate to their uses.

#### Learning Objectives

- 4.a. Identify the properties and uses of various types of iron and steel.
- 4.b. Identify the properties and uses of various non-ferrous metals.

### 5. Relate machining theory principles to machining applications.

#### Learning Objectives

- 5.a. Recognize aspects of cutting tool geometry, its purpose, and its function.
- 5.b. Calculate correct speeds and feeds for various types of machining operations.
- 5.c. Compare the use of high-speed steel and carbide cutting tools in machining applications.
- 5.d. Determine cutting fluid recommendations for various machining operations.

### 6. Apply machining reference markings to the workpiece.(Layout)

#### Learning Objectives

- 6.a. Describe the proper preparation procedures for laying out a workpiece.
- 6.b. Determine datums(edges) that reference markings must be associated with.
- 6.c. Determine layout tools needed for the situation.

### 7. Demonstrate proper use of vertical and horizontal cutoff saws.

#### Learning Objectives

- 7.a. Recognize potential safety hazards associated with cutoff saws and operations.

- 7.b. Demonstrate proper use of workholding devices associated with cutoff saws.
- 7.c. Select proper saw band for various sawing situations.
- 7.d. Select proper cutting fluid for various sawing situations.

**8. Demonstrate various operations commonly performed with drilling machines .**

**Learning Objectives**

- 8.a. Recognize potential safety hazards associated with drilling machines and processes.
- 8.b. Use proper tooling for various operations commonly performed on drilling machines.
- 8.c. Use proper cutting fluids for various operations commonly performed on drilling machines.
- 8.d. Demonstrate proper use of workholding devices commonly used on drilling machines.
- 8.e. Demonstrate proper hole location techniques.
- 8.f. Determine proper speeds and feeds for various operations commonly performed on drilling machines.

**9. Demonstrate proper housekeeping practices.**

**Learning Objectives**

- 9.a. Describe actions that must be taken after completing work at/in any given work station/area.

**10. Demonstrate various operations commonly performed on an engine lathe.**

**11. Demonstrate various operations commonly performed on a vertical milling machine.**