



Western Technical College

31442310 Welding-Oxy-Fuel Metals Cutting

Course Outcome Summary

Course Information

Description	This course is designed to teach cutting and heating for the purposes of: loosening; joint preparation for welding and repair; structural shape coping using oxy-acetylene, air carbon arc and plasma arc techniques.
Career Cluster	Manufacturing
Instructional Level	Technical Diploma Courses
Total Credits	1
Total Hours	36

Textbooks

Modern Welding – with Access. 12th Edition. Copyright 2020. Althouse, Andrew D., Carl H. Turnquist, and William A. Bowditch. Publisher: Goodheart-Wilcox Co. **ISBN-13:** 978-1-63563-913-1. Required.

Learner Supplies

Welding sateen jacket, welding work gloves (long leather gauntlet, short leather work gloves), welding helmet, leather cape and sleeves. **Vendor:** To be discussed in class. Required.

Tools: 25' steel tape measure, metal combination square, and scribe. **Vendor:** To be discussed in class. Required.

Six inch leather steel toed work boots - \$75.00-150.00. **Vendor:** To be discussed in class. Required.

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

Program Outcomes

1. Demonstrate industry recognized safety practices.
2. Interpret welding drawings.
3. Perform thermal cutting.

Course Competencies

1. List oxy-acetylene safety precautions and rules for set-up and use of equipment.

Assessment Strategies

- 1.1. Written Product

Learning Objectives

- 1.a. Identify safety features of an oxy-acetylene outfit.
1.b. List safety precautions when performing oxy-fuel welding and cutting.
1.c. Describe the safety precautions when handling and storing oxy-fuel cylinders.

2. Perform set-up procedures for oxy-fuel welding and cutting equipment.

Assessment Strategies

- 2.1. Skill Demonstration

Learning Objectives

- 2.a. Follow the steps listed in the job sheets, set-up the regulators, torch and hoses.
2.b. Follow the proper procedure to check connections for leaks.
2.c. Clean the tip.
2.d. Light and adjust the torch.
2.e. Close the tanks and shut down the cutting outfit.

3. Perform manual cutting of plate, pipe, channel, beams and angle iron to prescribed tolerance.

Assessment Strategies

- 3.1. Skill Demonstration

Criteria

You will know you are successful when

- 3.1. you verify cuts meet the performance and workmanship requirements of the AWS D1.1 Structural Code 5.15.4.3.

Learning Objectives

- 3.a. Demonstrate safe operating principles while performing cutting operations.
3.b. Inspect visually all flame cut edges.
3.c. Make adjustments in technique to compensate for cutting variables.

4. Identify the safety precautions and operation procedures of manual plasma cutting.

Assessment Strategies

- 4.1. Written Product

Learning Objectives

- 4.a. List safety hazards associated with the operation of the plasma cutting torch.
4.b. Identify capacity of the plasma cutting equipment.
4.c. Identify components of the plasma torch.
4.d. Inspect visually the cut edge.

5. List advantages of plasma cutting.

Assessment Strategies

- 5.1. Written Product

Learning Objectives

- 5.a. Identify capacity of the plasma cutting equipment.
5.b. List types of materials the plasma torch will cut (carbon steel, stainless steel and aluminum).

6. Perform manual cutting, straight lines and circles, using the plasma process on plate.

Assessment Strategies

- 6.1. Skill Demonstration

Criteria

You will know you are successful when

- 6.1. you set up, adjust and make cuts with the plasma torch according to the job sheets.

6.2. you verify the cut meets those of AWS D1.1-5.15.4.3 standards.

Learning Objectives

- 6.a. Demonstrate safe operating procedures while performing cutting operations as specified in the student's worksheets.
- 6.b. Inspect visually all plasma cut edges.
- 6.c. Make adjustments in technique to compensate for cutting variables.

7. Identify components of the air carbon arc cutting equipment.

Assessment Strategies

7.1. Written Product

Learning Objectives

7.a. Identify and assemble the torch, cables, power source, carbon electrode and air line.

8. Complete air carbon arc cutting and metal removal operations.

Assessment Strategies

8.1. Skill Demonstration

Criteria

You will know you are successful when

8.1. you demonstrate proper arc cutting and meet the workmanship requirements of the AWS D1.1 Structural Steel Code.

Learning Objectives

- 8.a. Interpret Part II Specific Processes-11 of the ANSI Z49.1 safety procedures
- 8.b. Identify components of the air carbon arc cutting equipment.
- 8.c. Identify process variables for air carbon arc cutting.
- 8.d. Demonstrate safe operating practices while performing air carbon arc cutting operations.
- 8.e. Inspect visually all workmanship samples.