Western Technical College

10442106 Manual Torch Metal Cutting Theory & Tech

Course Outcome Summary

Course Information

Description	This course is designed to teach theory and technique of 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	Associate Degree Courses
Total Credits	1
Total Hours	18

Textbooks

No textbook 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. Perform thermal cutting

Course Competencies

1. Perform cutting to prescribed tolerance.

Assessment Strategies

1.1. Skill Demonstration

Criteria

You will know you are successful when

1.1. you verify edges are not irregular
1.2. you cut through the entire thickness
1.3. you verify drafting is perpendicular to the surface
1.4. you set up appropriate template for the selected part

Learning Objectives

1.a. Practice using a guide or template to cut straight lines and circles.
1.b. Cut plate, pipe, channel, beams and angle iron.
1.c. Make adjustments to technique while cutting to compensate for variables.

2. Perform manual oxy-fuel cutting.

Assessment Strategies

2.1. Skill Demonstration
2.2. Written Product

Criteria

You will know you are successful when

2.1. you setup the oxy-fuel cutting equipment correctly
2.2. you operate the equipment following industry-standard guidelines
2.3. you shut-down the oxy-fuel equipment correctly
2.4. you verify that equipment is functioning correctly (i.e. no leaks, connections work, etc.).
2.5. you list the types of metal used for oxy-fuel cutting.

Learning Objectives

2.a. Identify types of metals commonly used for oxy-fuel cutting.
2.b. Follow safety regulations to transport and connect oxy-fuel bottles.
2.c. Follow standard 16-step procedure for using oxy-fuel cutting equipment (setup, operation, and shut down).
2.d. Check for leaks.

3. Perform manual plasma cutting.

Assessment Strategies

3.1. Skill Demonstration

Criteria

You will know you are successful when

3.1. you setup the manual plasm cutting equipment correctly
3.2. you operate the equipment following industry-standard guidelines
3.3. you shut-down the manual plasma cutting equipment correctly
3.4. you verify that equipment is functioning correctly (i.e. torch head, cutting tip, air line, etc.)
3.5. you reassemble the plasma torch correctly.
3.6. you check consumables and verify the need for replacement.

Learning Objectives

3.a. Identify components of the plasma torch (i.e torch, cables, power source, carbon electrode and air line).

3.b. Identify the safety precautions and operation procedures of manual plasma cutting.
3.c. Dissemble the torch gun.
3.d. Assemble the consumables on the torch gun.
3.e. Select appropriate machine settings for the application.
3.f. Check power and air connections.
3.g. Identify capacity of the plasma cutting equipment.
3.h. Determine when consumables need to be replaced on the plasma torch.

4. Perform carbon arc cutting.

Assessment Strategies

4.1. Skill Demonstration

Criteria

You will know you are successful when

4.1. You verify the working environment is safe
4.2. You setup the carbon-arc cutting equipment correctly
4.3. You operate the carbon-arc cutting equipment following industry standards
4.4. You shut down the carbon-arc cutting equipment correctly.
4.5. You demonstrate proper cutting angle techniques for the application.
4.6. You verify that equipment is functioning correctly (i.e. air hose, cable connections, torch head, etc.)

Learning Objectives

4.a. Identify capacity of the carbon arc cutting equipment.
4.b. Identify components of the carbon arc cutting equipment.
4.c. Follow safety regulations for carbon arc cutting.
4.d. Verify cutting and torch head angle prior to cut.
4.e. Identify application for using carbon arc cutting.
4.f. Use carbon arc cutting for metal removal operations.