

Western Iowa Tech Community College
Course Outline of Record

Date: 05/01/2014

Prefix & No.: WEL 120 Course Title: Oxy Fuel Welding and Cutting

Semester **Credit** Hours: 2.00

Lecture **Contact** Hours per Semester: 16.00

Lab **Contact** Hours per Semester: 48.00

Clinical **Contact** Hours per Semester: 0.00

OJT or Internship **Contact** Hours per Semester:

Course/Lab Fee: Yes No

Pre and Post Assessments: __

Course Description

In this course students will learn the fundamentals of oxy/fuel welding including the safe operation, proper setup, and welding and metal cutting skills. Topics include fusion welding and brazing on light gauge metals, cutting on heavy and light gauge metals, and welding of small diameter pipe.

Prerequisite: None

Corequisite: None

Course Needs Statement

This course will give the student a good understanding of the fusion process involved in welding and will develop good safety habits in using gas welding and cutting equipment that is found in industry.

Required Textbooks and/or materials

Yes No Other

Course Objectives:

The course will provide information which should enable the student to:

1. Operate oxy-acet welding equipment in a safe manner
2. Identify common oxy fuel gases
3. Select proper filler metals
4. Fusion weld in the flat and vertical positions
5. Braze in the flat and vertical positions
6. Perform cutting operations using manual and automatic equipment
7. Perform cutting operations on heavy and light metal
8. Make repairs using the oxy-acetylene process

Content Outline

- I. Oxy-acetylene Welding Safety
 - A. Cylinders
 - B. Hoses
 - C. Blow pipes
 - D. Welding pipes
 - E. Harmful fumes and gases
- II. Fuel Gases
 - A. Acetylene
 - B. Mapp
 - C. Propane and natural gas
 - D. Liquefied gases
- III. Filler Metals
 - A. Ferrous Metal
 1. Mild steel
 2. Cast Iron
 - B. Non Ferrous Metal
 1. Aluminum

- 2. Copper
- C. Brazing
 - 1. Cast iron
 - 2. Dissimilar metals
- IV. Fusion Welding
 - A. Melting points
 - B. Torch and rod control
 - C. Welding tip sizes
 - D. Joint preparation
 - E. Puddle control
- V. Brazing
 - A. Flux types
 - B. Joint preparation
 - C. Heat range
 - D. Dissimilar metals
- VI. Flame Cutting
 - A. Torch types
 - B. Cutting tip sizes and core
 - C. Machine cutting
 - D. Cutting tip sizes
 - E. Hand cutting
 - F. Distortion
- VII. Repair Welding
 - A. Cleaning
 - B. Joint preparation
 - C. Preheat & post heat
 - D. Stress relieving

Assessment

Course Competencies

At the conclusion of the course, the student will be able to:

1. Understand and apply all safety measures using an oxy/fuel system
2. Perform the proper set up of an oxy-acetylene apparatus
3. Demonstrate setting the proper gas pressures and filler metals for various applications
4. Prepare joints for fusion welding
5. Perform fusion welding in the flat and vertical position
6. Prepare joints for brazing in the flat and vertical position
7. Select the proper flux for various brazed joints
8. Determine the proper heat for brazing
9. Select the correct cutting tips for heavy and light gauge metal
10. Perform clean cuts on heavy and light gauge metal
11. Demonstrate proper stringer bead welds to AWS standards
12. Demonstrate proper Square Butt welds to AWS standards
13. Demonstrate proper Tee Joint welds in the flat position to AWS standards
14. Demonstrate proper Lap Joint welds in the flat position to AWS standards
15. Make clean cuts on heavy and light gauge metal

Addendum

Prefix & No.: WEL 120 **Course Title:** Oxy Fuel Welding and Cutting

Key words:

Required Textbooks and/or Materials

Title: Procedure Handbook of Arc Welding

Author: Lincoln Electric

Edition:

Publisher: **Lincoln Electric**

ISBN-13:

ISBN-10:

Title: **Welding Principles and Applications**

Author: **The James F. Lincoln Arc Welding Foundation**

Edition: **14th, May 2000**

Publisher: **The James F. Lincoln Arc Welding Foundation**

ISBN-13: **978-1-4018-5275-1**

ISBN-10:

Other Materials: **safety glasses, goggles, pliers, and gloves**

Course/Lab Fee: \$75.00

Rationale (usage) for lab fees:

Additional Information:

Common Final: Yes No

See Division Chair for facility and equipment needs.

Reminder: Each Course Outline of Record is expected to be reviewed every five (5) years.

Attached Files: