

**Western Iowa Tech Community College
Course Outline of Record**

Date: 09/24/2015

Prefix & No.: WEL 147 Course Title: ARC Welding Introduction (SMAW)

Semester **Credit** Hours: 3.00

Lecture **Contact** Hours per Semester: 16.00

Lab **Contact** Hours per Semester: 64.00

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

This is the first of two courses designed for students to prepare for the AWS Certification. A combined lecture and lab course, students study safety, heat settings, polarity, and the proper selection of electrodes in the arc welding process. Topics include welding on carbon steel plate using visual and destructive methods of determining weld quality to AWS Standards.

Prerequisite: None

Corequisite: None

Course Needs Statement

Course revised to meet local industry needs and national accreditation requirements for WITCC welding students.

Required Textbooks and/or materials

Yes No Other

Course Objectives:

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

1. Follow safety procedures for welders
2. Visually inspect welds and to do practical weld tests
3. Select proper electrodes
4. Select welding parameters (i.e., type of current, amp setting)
5. Identify power sources
6. Describe various weld joints
7. Explain distortion

Content Outline

- I. Orientation
- II. Safety in Welding
 - A. Eye & ear protection
 - B. Respiratory protection
 - C. Ventilation
 - D. Electrical safety
 - E. Work clothes
 - F. Gas cylinders
 - G. Hand & power tools
- III. Electrode Selection
 - A. Core wire
 - B. Functions of flux
 - C. AWS identification system
- IV. Weld Inspection and Testing
 - A. Porosity and its causes
 - B. Slag inclusions
 - C. Weld size
- V. Power Sources

- A. Generators & alternators
 - B. Transformers
 - C. Rectifiers
 - D. Voltage
 - E. Amperage
 - F. Duty cycle
- VI. Distortion
- A. Joint design
 - B. Types of welds
 - C. Weld location
 - D. Heat control
- VII. AWS Testing (Flat Position)
- A. Fillet weld break test

Assessment

Course Competencies

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

1. Interpretation of safe welding practices
2. Interpret electrode ID numbers & their respective uses
3. Determine proper welding current and amperage
4. Describe weld defects
5. Determine joint design & weld size
6. Describe the differences in welding power sources
7. Explain what causes distortion and by what means a welder can help control it
8. Perform shop work in a safe manner
9. Set up an arc welding machine
10. Produce welds in flat and horizontal positions according to welding codes (AWS, ASTM, ASME, API)
11. WEL 147 Task Demonstration List
 - a. Pad E6013 flat
 - b. Pad E7018 flat
 - c. Tee E7018 3/16" fillet horizontal
 - d. Pad E6010 flat" fillet (vert.)
 - e. Tee E6010 3/16" fillet horizontal
 - f. 3-bead tee 3/8" fillet E7018 horizontal
 - g. Sq. butt weld E6010 (flat)

Addendum

Prefix & No.: WEL 147 **Course Title:** ARC Welding Introduction (SMAW)

Key words:

Required Textbooks and/or Materials

Title: Welding Principles and Applications

Author: Jeffus & Johnson

Edition: Current

Publisher: Delmar Publications

ISBN-13:

ISBN-10:

Other Materials: Safety Glasses, Wire Brush, Chipping Hammer, Gloves and Pliers

Course/Lab Fee: \$0.00

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: