

ATIW-1600: WELDING FUNDAMENTALS FOR IRONWORKERS

Cuyahoga Community College

Viewing: ATIW-1600 : Welding Fundamentals for Ironworkers

Board of Trustees:

March 2020

Academic Term:

Fall 2020

Subject Code

ATIW - Appld Indus Tech - Ironworking

Course Number:

1600

Title:

Welding Fundamentals for Ironworkers

Catalog Description:

Fundamentals of welding with special emphasis on the ironworking trade. Includes welding processes; cutting and gouging processes; operational and site safety; welding equipment and tools; and safety equipment and protective clothing.

Credit Hour(s):

3

Lecture Hour(s):

3

Requisites

Prerequisite and Corequisite

ATIW-1300 Structural Steel Concepts, and ATIW-1310 Safety for Ironworkers; or departmental approval.

Outcomes

Course Outcome(s):

Explain welding and cutting processes.

Objective(s):

1. Analyze Shielded Metal Arc Welding (SMAW).
2. Analyze Flux Core Arc Welding (FCAW).
3. Analyze Oxyfuel Burning.
4. Analyze Oxyfuel Welding.

Course Outcome(s):

Demonstrate welding and cutting processes.

Objective(s):

1. Apply proper welding technique in the four main positions: Flat, Horizontal, Vertical, and Overhead.
2. Select proper weld process for task.
3. Ensure that all welds have proper bead formation, initiation, and termination.
4. Troubleshoot all weld processes.

Course Outcome(s):

Demonstrate safe operation of common welding equipment and tools on a typical job site.

Objective(s):

1. Explain welding power supply set up.
 2. Utilize electrode holders in the welding process.
 3. Utilize proper work clamps and cables.
 4. Select proper electrodes.
 5. Apply proper maintenance to equipment and tools on the job site.
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Course Outcome(s):

Demonstrate the use of safety equipment and protective clothing.

Objective(s):

1. Select proper personal protective equipment for the process used.
 2. Calculate proper current flow for type and size of electrode.
 3. Utilize proper shade lens for the weld process used.
 4. Select proper clothing for the process used.
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Course Outcome(s):

Describe safety concerns of welding performance including tools, equipment, protective clothing, and the environment.

Objective(s):

1. Select proper size electrode holder and work clamps for process used.
 2. Explore the advantages of selecting the proper power sources.
 3. Evaluate the importance of proper Personal Protection Equipment (PPE).
 4. Analyze environmental hazards including wind, rain, heat, and other job site conditions.
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Methods of Evaluation:

1. Quizzes
2. Exams
3. Classroom participation
4. Demonstration of project assignments

Course Content Outline:

1. Safety concerns
 - a. Welding fundamentals
 - b. Welding equipment
 - i. machines
 - ii. cables
 - c. Personal welding safety equipment
 - i. welding hoods
 - ii. lens shade
 - iii. protective clothing
 - d. Environmental requirements
- e. Tools
 - i. driving tools
 - ii. chipping tools
 - iii. wire brushes
 - iv. clamping tools
 - v. alignment tools
 - vi. measuring tools
 - vii. jacks
 - viii. marking tools
 - ix. cleaning tools
2. Welding processes
 - a. Shielded metal arc welding
 - b. Flux cored arc welding

- c. Air carbon arc welding
 - d. Projection welding
 - e. Submerged arc welding
3. Cutting and gouging processes

Resources

Althouse, Turnquist, et al. (2020) *Modern Welding (12th ed.)*, Tinley Park, Illinois: Goodheart-Willcox.

Bennett, A.E., and Soy Lewis. (2015) *Blueprint Reading for Welders (9th ed.)*, Albany, New York: Delmar.

Bowditch, William. (2009) *Welding Technology Fundamentals (4th ed.)*, Tinely Park, Illinois: Goodheart-Willcox.

Gibson, Stuart. (1997) *Advanced Welding*, Basingstoke, England: Macmillan.

Jeffus, Larry F. *Welding: Principles and Applications (8th ed.)*. 8th ed. Albany: Delmar, 2017.

International Association of Bridge, Structural and Ornamental Iron Workers. (1990) *Welding Manual for Ironworkers, Manual No. 1: Introduction to Welding*, Washington, D.C.: AFL-CIO.

Resources Other

International Association of Bridge, Structural, Ornamental and Reinforcing IronWorkers, Instructor Materials. <http://www.ironworkers.org/training/for-instructors>

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