

WELD 0002A - WIRE FEED WELDING PROCESSES - CAREER PATH

Catalog Description

Formerly known as WELD 40

Hours: 72 (18 lecture, 54 laboratory)

Description: Designed for those interested in beginning stages of welding. Various forms of wire feed welding include Gas Metal Arc and Flux Core Welding processes. Explores the various modes of metal transfer when using the Gas Metal Arc Welding process. In Flux Cored Arc Welding, both Self Shielding and Dual Shielding, are covered. (not transferable)

Course Student Learning Outcomes

- CSLO #1: Apply knowledge of safety standards for both a learning environment and work site environment with focus on GMAW, FCAW welding processes to perform student assignments.
- CSLO #2: Define terms related to this course; electrical stick out, inductance, pinch effect, synergic control, mode of transfer, transition current, whiskers, and wave form.
- CSLO #3: Demonstrate GMAW welding skills with stringer and weaved techniques on carbon steel plate in 2F, 3F and 4F position with short circuit mode of transfer.
- CSLO #4: Demonstrate FCAW-G skills on carbon steel in 2F, 3F, and 3G welding positions, with gas shield derivatives of this welding process.
- CSLO #5: Perform assembly of assigned student project assembled using the GMAW-S process.

Effective Term

Fall 2019

Course Type

Credit - Degree-applicable

Contact Hours

72

Outside of Class Hours

36

Total Student Learning Hours

108

Course Objectives

Lecture Objectives:

1. Describe safe personal practices when using various types of welding equipment.
2. Recognize and explain the different welding modes used in class.
3. Recognize and identify welding wires including: flux cored, metal cored and solid alloys and understand the function of different shielding gases.
4. Name and explain the types of power supplies used for different welding modes.

5. Name and define the four basic welding position in plate; and four pipe positions.
6. Sequence the steps of operation in course project.
7. Define Welding Symbols as used in class assignments.

Laboratory Objectives:

1. Employ safe personal practices when using various types of welding equipment.
2. Apply the skills of the different welding modes used in class in welding practice.
3. Recognize and explain the different welding modes listed, and apply the skills in welding practice.
4. Recognize and identify welding wires including: flux cored, metal cored and solid alloys and understand the function of different shielding gases.
5. Apply setting to effect change in welding modes of transfer.
6. Perform a weld test on a Single Vee open groove 3/8" thick butt joint in the 3G position.
7. Construct assigned course project using GMAW-S process.
8. Apply Welding Symbols in performance of job assignments.

General Education Information

- Approved College Associate Degree GE Applicability
- CSU GE Applicability (Recommended-requires CSU approval)
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

Articulation Information

Methods of Evaluation

- Objective Examinations
 - Example: 1. Students will take a multiple choice test on welding symbols. Standard Grading
- Projects
 - Example: 1. At the start of assigned project, the student will demonstrate a material layout. 2. During the assembly of assigned project, the student will perform fit up steps and tacking procedures. Grading based on industry standard.
- Skill Demonstrations
 - Example: 1. Students will demonstrate the ability to safely weld in the vertical up and vertical down positions. 2. Student will perform an open groove welding test. 3. Student will demonstrate settings used for various welding modes in GMAW. Grading is based on industry standard.

Repeatable

No

Methods of Instruction

- Laboratory
- Lecture/Discussion
- Distance Learning

Lab:

1. With instructor demonstration and oversight, students will apply various welding techniques using Short Circuit, Globular, Spray, and Pulsed Spray Transfers.

- Following class lecture, video presentation, and lab demonstration, instructor will supervise while students practice with flux cored, metal cored and solid alloys.

Lecture:

- Lecture and interpersonal group discussion on the various types and applications of welding modes, such as FCAW-G Flux Cored Welding with dual Shielding vs FCAW-S Flux Cored Welding self shielding.

Distance Learning

- Instructor will use slide show presentation, instructor created video, or lecture presentation on a learning platform to teach about best safety practices in the for personal protective equipment, the weld lab environment, and/or tools & equipment. Students will be given a scenario and expected to list the best safety practices that should be employed and explain why they should be used. Students will submit the assignment via text entry, file upload, video or audio recording.

Typical Out of Class Assignments Reading Assignments

- The student will read chapter from the course text on GMAW transfer modes of short circuit, globular, spray transfer, and related materials and be prepared for classroom discussion.
- The student will look up the welding parameters for the different wire diameters and compositions to become familiar with the correct machine settings to use.

Writing, Problem Solving or Performance

- The student will create a report of the different chemical compositions from the reading assignments welding procedures for Flux Cored, Metal Cored and other solid alloys.
- Students demonstrate their performance of each of the various welds, such as pulsed spray transfer, on lab assignments during each class meeting.

Other (Term projects, research papers, portfolios, etc.)

Required Materials

- Welding Principles and Practices
 - Author: Edward R. Bohnart
 - Publisher: McGraw Hill
 - Publication Date: 2017
 - Text Edition: 5th
 - Classic Textbook?:
 - OER Link:
 - OER:
- Welding Skills
 - Author: B. J. Moniz & R. T. Miller
 - Publisher: American Technical
 - Publication Date: 2010
 - Text Edition: 4th
 - Classic Textbook?:
 - OER Link:
 - OER:
- Welding: Principles and Applications

- Author: Larry F. Jeffus
- Publisher: Delmar / Cengage Learning
- Publication Date: 2011
- Text Edition: 7th
- Classic Textbook?:
- OER Link:
- OER:
- Gas Metal Arc Welding
 - Author: William H. Minnick
 - Publisher: Goodheart-Willcox
 - Publication Date: 2008
 - Text Edition: 5th
 - Classic Textbook?:
 - OER Link:
 - OER:
- Flux Cored Arc Welding
 - Author: William H. Minnick
 - Publisher: Goodheart-Willcox
 - Publication Date: 2009
 - Text Edition: 3rd
 - Classic Textbook?:
 - OER Link:
 - OER:

Other materials and-or supplies required of students that contribute to the cost of the course.