

## EICC COURSE DEVELOPMENT MODEL (CDM)

**CATALOG COURSE NUMBER:** WEL-275

**COURSE TITLE:** Shielded Metal Arc Welding II: SENSE1

Originating College: ☐CCC ☐MCC ☒SCC

Effective Term/Year: Fall 2015

Initiating Faculty Member: Bruce Baldwin

Initiating Department Coordinator: Ben Kettering

### Reason for submission: Check all that apply

☒ New Course If yes, type of course:

☐ A&S

To be considered for General Education? ☐ Yes ☐ No Category:

To be part of an A & S Concentration? ☐ Yes ☐ No Concentration:

☒ CTE Program Title: Shielded Metal Arc Welding 2 ☐ Required ☒ Elective

☐ General Education or Program Review ☐ Reactivation of an inactive course ☐ Making course inactive

☒ Changing course; please explain: Changing course to Vertical and Overhead welding positions and Three semester credit hours.

☐ Other; please explain:

### Contact Hours/Distribution of Contact Hours

#### Lecture Hours

#### Lab Hours

#### Clinical Hours

#### Coop Hours

Hours per Week: 1.50 Hours per Week: 3.00 Hours per Week: Hours per Week:

Number of Weeks: 16.50 Number of Weeks: 16.50 Number of Weeks: 16.50 Number of Weeks: 16.50

**\*\*Note: If offering a course for the full fall or spring semester, the number of weeks is 16.5**

Total Lecture Hrs: 29.70 Total Lab Hrs: 59.40 Total Clinical Hrs: Total Coop Hrs:

**Semester Hours Credit:** 3.00 if variable credit, give range:

Allow repeat\* for credit: ☐ Yes ☒ No

If yes, total course repeats allowed: If yes, total credits:

\*Note that repeat for credit means a student can pass the course and then repeat it for additional credit. An internship course is an example of a course that could be set up as repeatable for additional credit

**Course or courses this CDM replaces, if any:** Shielded Metal Arc Welding Basic WEL-126

**CATALOG COURSE DESCRIPTION:** This course focuses on safety, amperage settings, polarity and the proper selection of electrodes for the Shielded Metal Arc Welding process. Students perform American Welding Society complaint welds on carbon steel, in vertical up and overhead configurations, using visual and destructive methods for determining weld quality. This course aligns to SENSE (Schools Excelling through National Skills Education) Level 1.

### RECOMMENDED ENTRY LEVEL SKILLS/KNOWLEDGE:

### PRE-REQUISITE COURSES

CCN#	COURSE TITLE
WEL 274	Shielded Metal Arc Welding I: SENSE1

### CO-REQUISITE COURSES

CCN#	COURSE TITLE

**PUBLISHED MATERIAL(S) USED FOR CDM DEVELOPMENT:** Hobart Institute of Welding Technology. Shielded Metal Arc Welding Basic EW369 . Troy, OH: Hobart Institute of Welding Technology, 2011. Print.

In general it is expected that source material will be dated within 5 years of this CDM date. If all materials/ textbooks cited above are older than this, please explain:

## GENERAL COURSE GOALS

Upon successful completion of this course the student should be able to:

- Demonstrate safe practices in the shielded metal arc welding process.
- Master entry-level welding skills in the shielded metal arc welding process.

## TOPICAL OUTLINE

1. Power Sources
2. Fillet Weld Lap Joint
3. Fillet Weld T-Joint
4. Three-Bead Fillet Weld
5. Square-Groove Weld Butt Joint
6. Square-Groove Weld Butt Joint Destructive Test
7. Fillet Weld Lap Joint
8. Three-Bead Fillet Weld T-Joint
9. Fillet Weld T-Joint Destructive Test
10. Square-Groove Weld Butt-Joint
11. Distortion Control
12. Fillet Weld Lap Joint
13. Stringer Beads
14. Fillet Weld Lap Joint
15. Multi-Pass Fillet Weld
16. Multi-Pass Fillet Weld
17. Multi-Pass Fillet Weld
18. AWS QC-10 3G Qualification Test

## COURSE OBJECTIVES

Upon successful completion of the course, a student should be able to:

1. Power Sources
  - a. Define Direct Current.
  - b. Define Alternating Current.
  - c. Explain Constant Voltage and Constant Current.
  - d. Interpret what is Duty Cycle.
2. Fillet Weld Lap Joint
  - a. Produce a quality weld in lap joints using uphill travel in the vertical position using E6010 electrodes.
3. Fillet Weld T-Joint
  - a. Create a quality multi-pass fillet weld in T-Joint configuration using the vertical up welding position utilizing E6010 electrodes.
4. Three-Bead Fillet Weld
  - a. Produce a quality multi-pass fillet weld in a T-Joint configuration using the vertical up welding position.
  - b. Demonstrate the inverted-T method for the root pass.
  - c. Demonstrate the box weave for the fill pass.
  - d. Demonstrate the z weave for the cover pass.
5. Square-Groove Weld
  - a. Produce a quality square-groove weld in butt joint configuration using the vertical up welding position utilizing E6011 and E7018 electrodes.
6. Square-Groove Weld Destructive Test
  - a. Produce a quality square-groove weld.
  - b. Perform a visual inspection.
  - c. Perform a guided bend test.
7. Fillet Weld Lap Joint
  - a. Produce a quality fillet weld in lap joint configuration using the overhead welding position.
8. Three Bead Fillet Weld
  - a. Produce a quality multi-pass fillet weld using the overhead welding position.
9. Fillet Weld Destructive Test
  - a. Produce a quality fillet weld in a t-joint configuration using the overhead welding position.
  - b. Exam weld visually.
  - c. Perform a break test.

10. Square-Groove Weld
  - a. Produce a quality square-groove weld in butt joint configuration using the overhead welding position.
11. Distortion Control
  - a. Discuss expansion.
  - b. Explain thermal conductivity.
  - c. Define distortion.
  - d. Choose guidelines for minimizing distortion.
12. Fillet Weld Lap Joint
  - a. Produce a quality fillet weld in lap and t-joints using the vertical down welding position.
13. Stringer Beads
  - a. Produce quality stringer beads using the vertical down welding position utilizing E6011 electrodes.
14. Fillet Weld Lap Joint
  - a. Create quality welds on metals of different thickness using the vertical down welding position.
15. Multi-Pass Fillet Weld
  - a. Produce quality multi-pass fillet welds in t-joint configuration using the vertical up welding position.
16. Multi-Pass Fillet Weld
  - a. Produce quality fillet welds in t-joints using the overhead welding position utilizing low hydrogen electrodes.
17. Multi-Pass Fillet Weld
  - a. Produce quality welds in t-joints using the vertical up and overhead welding positions utilizing E7018 electrodes.
18. AWS QC10 3G Qualification Test
  - a. Produce a quality single-v-groove weld in the vertical up welding position.
  - b. Perform a visual inspection.
  - c. Perform a guided bend test.

**RECOMMENDED METHODS OF INSTRUCTION:** Check all appropriate methods of instruction to facilitate student learning of course objectives.

- |  |   |
|--|---|
| <input type="checkbox"/> Case Studies                                  | <input checked="" type="checkbox"/> Class Discussions       |
| <input type="checkbox"/> Computer lab work                             | <input checked="" type="checkbox"/> Computer-assisted tools |
| <input type="checkbox"/> Computer-assisted writing                     | <input type="checkbox"/> Conducting experiments             |
| <input type="checkbox"/> Demonstration or modeling                     | <input type="checkbox"/> Electronic interaction             |
| <input type="checkbox"/> Field observation                             | <input type="checkbox"/> Field trips                        |
| <input type="checkbox"/> Guest speaker                                 | <input checked="" type="checkbox"/> Guided practice         |
| <input type="checkbox"/> In-class writing or editing workshops         | <input type="checkbox"/> Journals                           |
| <input type="checkbox"/> Lecture                                       | <input type="checkbox"/> Library instruction and resources  |
| <input type="checkbox"/> Model building                                | <input type="checkbox"/> Peer review                        |
| <input type="checkbox"/> Readings                                      | <input type="checkbox"/> Role play                          |
| <input type="checkbox"/> Service learning                              | <input checked="" type="checkbox"/> Simulation              |
| <input type="checkbox"/> Student and instructor conferences            | <input type="checkbox"/> Student collaborative learning     |
| <input type="checkbox"/> Student presentation                          | <input checked="" type="checkbox"/> Student projects        |
| <input checked="" type="checkbox"/> Tests or quizzes                   | <input type="checkbox"/> Worksheets/surveys                 |
| <input type="checkbox"/> Writing assignments/exercises (graded or not) |   |
| <input type="checkbox"/> Other (please list specifics):                |   |

**RECOMMENDED EVALUATION METHODS:** Check all appropriate methods of evaluation to assess student achievement of course objectives.

- |   |   |
|---|---|
| <input type="checkbox"/> Class workshops        | <input checked="" type="checkbox"/> Classroom discussions/participation |
| <input type="checkbox"/> Collaborative work     | <input checked="" type="checkbox"/> Demonstration of skill(s)           |
| <input type="checkbox"/> Individual conferences | <input type="checkbox"/> Journals                                       |
| <input type="checkbox"/> Laboratory reports     | <input type="checkbox"/> Oral presentations                             |
| <input type="checkbox"/> Portfolios             | <input type="checkbox"/> Pretest/Posttest                               |
| <input type="checkbox"/> Quizzes                | <input type="checkbox"/> Reading responses                              |

☐ Student presentations

☒ Tests

☐ Other (please list specifics):

☒ Student projects

☐ Writing Assignments

**ATTENDANCE:** Policies on attendance will be formulated by the instructor and communicated to the students on the course syllabus.

**ACADEMIC DISHONESTY:** Policies on academic dishonesty can be found in the EICC student code of conduct published in the student handbook.

### CDM CREATION/REVIEW/REVISION INFORMATION

Originally Written by:

Date:

Department Chair, Comments, & Date:

Does similar curriculum exist at other EICC Colleges? ☐ CCC ☐ MCC ☐ SCC ☐ No

If yes, Counterparts Consulted, College, Comments & Date:

### CDM Review or Revision Date:

Faculty member(s) & College:

Does similar curriculum exist at other EICC Colleges? ☐ CCC ☐ MCC ☐ SCC ☐ No

Changes made to course which will require further review steps:

☐ Making course inactive ☐ Credit hours ☐ Contact hours ☐ Course Description

☐ 25% or more of course objectives ☐ Other minor revisions or no revisions

Dean Review, Comments & Date:

### If changes made require further review and approval:

College Curriculum Committee Sign-off & Date:

IC Review Subcommittee Sign-off & Date:

Instructional Council Approval: