

EICC COURSE DEVELOPMENT MODEL (CDM)

CATALOG COURSE NUMBER: WEL-257

COURSE TITLE: Flux Core Arc Welding

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: Flux Cored Arc Welding ☐Required ☒Elective

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

☐Changing course; please explain:

☐Other; please explain:

Contact Hours/Distribution of Contact Hours

Lecture Hours

Lab Hours

Clinical Hours

Coop Hours

Hours per Week: 1.00 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: 19.80 Total Lab Hrs: 59.40 Total Clinical Hrs: Total Coop Hrs:

Semester Hours Credit: 2.50 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: Flux Cored Arc Welding WEL-132.

CATALOG COURSE DESCRIPTION: This course provides training to develop the manual skills on carbon steels using small diameter and large diameter flux cored electrodes (with and without shielding gas) in all positions on fillet and groove welds.

RECOMMENDED ENTRY LEVEL SKILLS/KNOWLEDGE:

PRE-REQUISITE COURSES

CCN#	COURSE TITLE
MFG 186	Plant Safety

CO-REQUISITE COURSES

CCN#	COURSE TITLE

PUBLISHED MATERIAL(S) USED FOR CDM DEVELOPMENT: Hobart Institute of Welding Technology EW369 FCAW, 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 manual skills on carbon steels using small diameter and large diameter flux cored electrodes (with and without shielding gas) in all positions on fillet and groove welds.

TOPICAL OUTLINE

1. Flux Cored Arc Welding (FCAW), Course Overview
2. Introduction to FCAW
3. Safety and Health of Welders
4. Equipment Setup, Adjustment and Maintenance
5. Fillet Weld, T-Joints, Horizontal, Vertical and Overhead
6. Electrode Classification and Selection
7. Single V-Groove Weld, Butt Joint, Horizontal
8. Single V-Groove Weld, Destructive Test
9. Single V-Groove Weld, Butt Joint, Vertical
10. Single V-Groove Weld, Butt Joint, Overhead
11. Single V-Groove Weld, Butt Joint, Horizontal
12. Single V-Groove Weld, Butt Joint, Vertical Up Stringers
13. Single V-Groove Weld, Destructive Test
14. Single V-Groove Weld, Butt Joint, Flat
15. Fillet Weld, Lap Joint, Flat
16. Single V-Groove Weld, Butt Joint, Destructive Test

COURSE OBJECTIVES

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

1. Flux Cored Arc Welding, Course Overview
 - a. Demonstrate entry level welding skills using the FCAW processes.
2. Introduction to FCAW
 - a. Explain FCAW operating principles.
 - b. Select correct power source.
 - c. Identify FCAW equipment.
3. Safety and Health of Welders
 - a. Demonstrate safe work practices.
 - b. Recognize unsafe work conditions.
4. Equipment Setup, Adjustment and Maintenance
 - a. Define constant current.
 - b. Select correct wire feed speed and voltage.
 - c. Perform cable liner and nozzle cleaning.
5. Fillet Weld, T-Joints, Horizontal, Vertical and Overhead
 - a. Assemble a t-joint using mild steel.
 - b. Produce quality multi-pass fillet welds using the horizontal, vertical and overhead welding positions.
6. Electrode Classification and Selection
 - a. Identify the American Welding Society classification system.
 - b. Explain self-shielded, gas-shielded, single-pass and multi-pass electrodes.
 - c. Define physical properties and chemical composition of base metals.
7. Single V-Groove Weld, Butt Joint, Horizontal
 - a. Construct a single v-groove butt joint.
 - b. Produce quality single v-groove butt joint welds using the horizontal welding position.
8. Single V-Groove Weld, Destructive Test
 - a. Produce a quality single v-groove weld.
 - b. Perform a visual inspection.
 - c. Perform a guided bend test.
9. Single V-Groove Weld, Butt Joint, Vertical
 - a. Assemble a single v-groove butt joint.
 - b. Produce quality single v-groove welds using the vertical up welding position.
10. Single V-Groove Weld, Butt Joint, Overhead
 - a. Construct a single v-groove butt joint.
 - b. Produce quality single v-groove welds using the overhead welding position.
11. Single V-Groove Weld, Butt Joint, Horizontal

- a. Assemble single v-groove butt joint.
- b. Produce quality single v-groove welds using the horizontal welding position.
- 12. Single V-Groove Weld, Butt Joint, Vertical Up Stringers
 - a. Construct single v-groove butt joint.
 - b. Produce quality single v-groove welds using vertical up stringer beads.
- 13. Single V-Groove Weld, Destructive Test
 - a. Produce a quality vertical up single v-groove butt joint weld.
 - b. Perform a visual inspection.
 - c. Perform a guided bend test.
- 14. Single V-Groove Weld, Butt Joint, Flat
 - a. Construct a single v-groove butt joint.
 - b. Produce quality single v-groove welds using the flat welding position.
- 15. Single V-Groove Weld, Butt Joint, Destructive Test
 - a. Produce a quality single v-groove butt joint weld using the flat position.
 - b. Perform a visual inspection.
 - c. Perform a guided bend test.
- 16. Fillet Weld, Lap Joint, Flat
 - a. Construct a lap joint
 - b. Produce quality fillet welds in lap joints using the flat welding position.

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 checked="" 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 checked="" type="checkbox"/> Quizzes | <input type="checkbox"/> Reading responses |
| <input type="checkbox"/> Student presentations | <input checked="" type="checkbox"/> Student projects |
| <input checked="" type="checkbox"/> Tests | <input type="checkbox"/> Writing Assignments |
| <input type="checkbox"/> Other (please list specifics): | |

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? <input type="checkbox"/> CCC <input type="checkbox"/> MCC <input type="checkbox"/> SCC <input type="checkbox"/> 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? <input type="checkbox"/> CCC <input type="checkbox"/> MCC <input type="checkbox"/> SCC <input type="checkbox"/> No	
Changes made to course which will require further review steps:	
<input type="checkbox"/> Making course inactive <input type="checkbox"/> Credit hours <input type="checkbox"/> Contact hours <input type="checkbox"/> Course Description	
<input type="checkbox"/> 25% or more of course objectives <input type="checkbox"/> 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:	