EICC COURSE DEVELOPMENT MODEL (CDM)

CATALOG COURSE NUMBER: WEL-274
COURSE TITLE: Shielded Metal Arc Welding I: 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 Basic ☐Required ☑Elective
☐General Education or Program Review ☐Reactivation of an inactive course ☐Making course inactive
☑Changing course; please explain: Changing course to flat and horizontal welding positions and 3 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 will perform American Welding Society compliant welds on carbon steel, 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
MFG 186	Plant Safety

CO-REQUISITE COURSES

CCN#	COURSE TITLE

PUBLISHED MATERIAL(S) USED FOR CDM DEVELOPMENT: Hobart Institute of Welding Technology. Shielded Metal Arc Welding Basic EW369 SMAWB. 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:

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

TOPICAL OUTLINE

1. Introduction to Shielded Metal Arc Welding
2. Shielded Metal Arc Welding Basic, Course Overview
3. Safety and Health of Welders
4. The Five Essentials
5. Striking and Controlling the Arc
6. Pad of Beads
7. Fillet Weld
8. Pad of Beads
9. The Welders Role in Quality Control
10. Fillet Weld T-Joint
11. Fillet Weld T-Joint Destructive Test
12. Pad of Beads
13. Square-Groove Weld
14. Square-Groove Weld Destructive Test
15. Fillet Weld Lap and T-Joints
16. Stringer Beads
17. Square-Groove Weld
18. Low Hydrogen Electrodes
19. Electrode Selection
20. Multi-Pass Fillet Weld
21. Multi-Pass Fillet Weld
22. AWS QC-10 Qualification Test, SENSE Level 1

COURSE OBJECTIVES

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

1. Introduction to Shielded Metal Arc Welding
   a. Discuss flat position welding.
   b. Discuss horizontal position welding.
2. Course Overview
   a. Describe Direct Current and its relation to the shielded metal arc welding process.
   b. Describe Alternating Current and its relation to the shielded metal arc welding process.
3. Safety and Health of Welders
   a. Demonstrate safe work practices.
   b. Recognize unsafe work conditions.
4. The Five Essentials
   a. Identify electrode diameter.
   b. Choose correct current.
   c. Create correct arc length.
   d. Develop correct travel speed.
   e. Utilize correct electrode angles.
5. Striking and Controlling the Arc
   a. Perform basic arc striking skills.
   b. Demonstrate the ability to control the arc.
   c. Develop the skill to manipulate the electrode.
6. Pad of Beads
   a. Produce a pad of surfacing welds utilizing E6011 electrodes.
7. Fillet weld
   a. Construct a lap joint using E6011 electrodes employing the horizontal position.
8. Pad of Beads
   a. Create a pad of surfacing welds using the whip-and-pause method using E6010 electrodes.

9. The Welders role in Quality Control
   a. Discuss welding procedure specifications.
   b. Interpret drawings.
   c. Explain distortion control.
   d. Identify defects and discontinuities.
10. Fillet Weld T-Joint
   a. Produce a quality multi-pass fillet weld using E6010 electrodes.
11. Fillet Weld T-Joint Destructive Test
   a. Produce a quality fillet weld using a T-Joint configuration.
   b. Perform a visual inspection.
   c. Perform a break test.
12. Pad of Beads
   a. Create a pad of surfacing welds in the horizontal position using E6010 electrodes.
13. Square-Groove weld
   a. Deposit a quality square-groove weld in a butt joint using the horizontal position.
14. Square-Groove Weld Destructive Test
   a. Construct a quality square-groove weld in a butt joint in the horizontal position.
   b. Exam weld visually for defects.
   c. Perform a guided bend test.
15. Fillet Weld Lap and T-Joints
   a. Produce quality fillet welds in Lap and T-Joints using the horizontal position and E6011 electrodes.
16. Stringer Beads
   a. Produce quality stringer beads on sixteen gauge mild steel in the horizontal position using E6011 electrodes.
17. Square-Groove Weld
   a. Produce a quality square-groove weld in lap and T-Joints in the flat and horizontal positions using E7024 electrodes.
18. Low Hydrogen Electrodes
   a. Discuss the advantages of low hydrogen electrodes.
   b. State tips for working with low hydrogen electrodes.
   c. Explain why and how low hydrogen electrodes are stored.
19. Electrode Selection
   a. Explain electrode classification system.
   b. Describe the electrode stampings.
20. Multi-pass Fillet Weld
   a. Produce a quality fillet weld in a T-joint configuration using the flat and horizontal welding position.
21. Multi-Pass Fillet Weld
   a. Construct a properly sequenced multi-pass weld in the lap joint configuration using a horizontal welding position.
22. AWS QC-10 Qualification Test, SENSE Level 1
   a. Produce a quality single-V-groove weld in the horizontal 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.*

☐ Case Studies	☑ Class Discussions
☐ Computer lab work	☑ Computer-assisted tools
☐ Computer-assisted writing	☐ Conducting experiments
☐ Demonstration or modeling	☐ Electronic interaction
☐ Field observation	☐ Field trips
☐ Guest speaker	☑ Guided practice
☐ In-class writing or editing workshops	☐ Journals
☐ Lecture	☐ Library instruction and resources
☐ Model building	☐ Peer review
☐ Readings	☐ Role play
☐ Service learning	☑ Simulation
☐ Student and instructor conferences	☐ Student collaborative learning

- ☐ Student presentation
- ☑ Tests or quizzes
- ☐ Writing assignments/exercises (graded or not)
- ☐ Other (please list specifics):
- ☑ Student projects
- ☐ Worksheets/surveys

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

- ☐ Class workshops
- ☐ Collaborative work
- ☐ Individual conferences
- ☐ Laboratory reports
- ☐ Portfolios
- ☐ Quizzes
- ☐ Student presentations
- ☑ Tests
- ☐ Other (please list specifics):
- ☑ Classroom discussions/participation
- ☑ Demonstration of skill(s)
- ☐ Journals
- ☐ Oral presentations
- ☐ Pretest/Posttest
- ☐ Reading responses
- ☑ 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:	