EICC COURSE DEVELOPMENT MODEL (CDM)

CATALOG COURSE NUMBER: WEL-258 COURSE TITLE: Shielded Metal Arc Welding Advanced II Originating College: CCC CMCC SCC Initiating Faculty Member: Bruce Baldwin

Effective Term/Year: Fall 2015 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?
Ves
No Concentration:

■ CTE Program Title: Shielded Metal Arc Welding Advanced 2 ■ 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: 2.00 Hours per Week: 6.00 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: 39.60 Total Lab Hrs: 118.80 Total Clinical Hrs: Total Coop Hrs:

Semester Hours Credit: 5.00 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 (SMAW) Advanced 2, WEL-216.

CATALOG COURSE DESCRIPTION: This course provides training to develop the manual skills necessary to produce quality single V-groove welds (open root) in all positions. This course is designed using E6010 and E7018 electrodes on medium thickness carbon steel.

RECOMMENDED ENTRY LEVEL SKILLS/KNOWLEDGE:

PRE-REQUISITE COURSES

| CCN# | COURSE TITLE | |
|----------------------|-------------------------------|--|
| WEL 215 | Shielded Metal Arc Weld-Adv 1 | |
| CO-REQUISITE COURSES | | |
| CCN# | COURSE TITLE | |
| | | |

PUBLISHED MATERIAL(S) USED FOR CDM DEVELOPMENT: Hobart Institute of Welding Technology EW369 SMAWA2, 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:

Practice safety procedures related to the SMAW process. Classify electrodes. Assemble various weld joints. Weld various weld joints.

TOPICAL OUTLINE

- 1. SMAW Advanced II, Course Overview
- 2. Introduction to SMAW
- 3. Safety and Health of Welders
- 4. Single V-Groove Weld, Butt Joint, Horizontal
- 5. Weld Size and Profile
- 6. Procedure and Welder Qualification
- 7. Single V-Groove Weld, Destructive Test
- 8. Single V-Groove Weld, Butt Joint, Vertical
- 9. Destructive Testing
- 10. Single V-Groove Weld, Butt Joint, Overhead
- 11. Nondestructive Testing
- 12. Single V-Groove Weld, Butt Joint, Vertical Down
- 13. Air Carbon Arc Cutting and Gouging
- 14. Single V-Groove Weld, Butt Joint, Vertical
- 15. Single V-Groove Weld, Destructive Test
- 16. Metals Identification for Welding
- 17. Single V-Groove Weld, Butt Joint, Overhead
- 18. Welding Cast Iron and Hard Surfacing Welds
- 19. Single V-Groove Weld, Butt Joint, Flat

COURSE OBJECTIVES

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

- 1. SMAW Advanced II, Course Overview
- a.Demonstrate advanced level welding skills.
- 2. Introduction to SMAW
- a.Recall the history of SMAW.
- b.Discuss the advantages and disadvantages of the smaw process.
- 3. Safety and Health of Welders
- a.Demonstrate safe work practices.
- b.Recognize unsafe work conditions.
- 4. Single V-Groove Weld, Butt Joint, Horizontal
- a.Assemble a single v-groove butt joint.
- b.Produce quality multi-pass single v-groove welds with open root using the horizontal welding position.
- 5. Weld Size and Profile
- a.Explain fillet and groove weld size.
- b.Demonstrate the correct use of a fillet weld gauge.
- 6. Procedure and Welder Qualification
- a.Interpret welding procedures.
- b.List the steps for a welder qualification.
- 7. Single V-Groove Weld, Destructive Test
- a.Produce a quality multi-pass single v-groove weld using the horizontal position.
- b.Perform a visual inspection.
- c.Perform a guided bend test.
- 8. Single V-Groove Weld, Butt Joint, Vertical
- a Assemble a single v-groove butt joint with an open root.
- b.Produce quality multi-pass single v-groove welds using the vertical welding position.
- 9. Destructive Testing
- a.Define the specific destructive tests.
- 10. Single V-Groove Weld, Butt Joint, Overhead
- a.Construct a single v-groove open root butt joint.
- b.Produce quality multi-pass single v-groove welds using the overhead welding position.

- 11. Nondestructive Testing
- a.Explain why nondestructive testing is used.
- b.List the four most commonly used.
- 12. Single V-Groove Weld, Butt Joint, Vertical Down
- a.Construct a single v-groove open root butt joint.
- b.Produce quality multi-pass single v-groove welds using the vertical down welding position.
- 13. Air Carbon Arc Cutting and Gouging
- a.List the four most common arc cutting processes.
- b.Explain the required welding equipment and their uses.
- 14. Single V-Groove Weld, Butt Joint, Vertical
- a.Construct a single v-groove open root butt joint.
- b.Produce quality multi-pass single v-groove welds using the vertical welding position.
- 15. Single V-Groove Weld, Destructive Test
- a. Produce a quality multi-pass single v-groove weld using the vertical welding position.
- b.Perform a visual inspection.
- c.Perform a side bend test.
- 16. Metals Identification for Welding
- a.Identify metals based on testing methods.
- 17. Single V-Groove Weld, Butt Joint, Overhead
- a.Assemble a single v-groove open root butt joint.
- b.Produce quality multi-pass single v-groove welds using the overhead welding position.
- 18. Welding Cast Iron and Hard Surfacing Welds
- a.List the electrodes for cast iron welding.
- b.Describe the processes for cast iron and hard surfacing welding.
- 19. Single V-Groove Weld, Butt Joint, Flat
- a.Construct a single v-groove open root butt joint.
- b.Produce quality multi-pass single v-groove welds using the flat welding position.

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 | Gonducting 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 | Student projects |
| Tests or quizzes | □Worksheets/surveys |
| Writing assignments/exercises (graded or not) | |
| □Other (please list specifics): | |

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

- □Class workshops
- □Collaborative work
- Individual conferences

Classroom discussions/participation
 Demonstration of skill(s)
 Journals

Laboratory reportsImage: Oral presentationsPortfoliosImage: Oral presentationsQuizzesImage: Oral presentationsStudent presentationsImage: Oral presentationsTestsImage: Oral presentationsOther (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? 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: | | | |