EICC COURSE DEVELOPMENT MODEL (CDM)

CATALOG COURSE NUMBER: WEL-256
COURSE TITLE: Gas Metal Arc Welding Basic
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: Gas Metal Arc Welding Basic ☐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:	5.00	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:	99.00	Total Clinical Hrs:		Total Coop Hrs:	

Semester Hours Credit: 4.50 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: Gas Metal Arc Welding Basic WEL-129.

CATALOG COURSE DESCRIPTION: This course covers safety and Gas Metal Arc Welding (GMAW) techniques in flat, horizontal, vertical and overhead positions. A variety of hands-on projects/experiments integrates and reinforces theoretical concepts in the laboratory setting.

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 GMAWB, 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:

The student should be able to develop entry level welding skills in the Gas Metal Arc Welding process.

TOPICAL OUTLINE

1. Gas Metal Arc Welding Basic, Course Overview
2. Introduction to Gas Metal Arc Welding
3. Safety and Health of Welders
4. Equipment Setup and Maintenance
5. Surfacing Welds, Flat
6. Square Groove and Fillet Welds, Flat
7. Square Groove and Fillet Welds, Horizontal
8. The Quality of Welds
9. Square Groove and Fillet Welds, Vertical Down
10. Square Groove and Fillet Welds, Vertical Up
11. Metal Transfer and Shielding Gases
12. Square Groove and Fillet Welds, Overhead
13. Single V-Groove Weld, Butt Joint, Horizontal
14. Single V-Groove Weld, Horizontal, Guided Bend Test
15. Single V-Groove Weld, Butt Joint, Vertical Down
16. Single V-Groove Weld, Vertical Down, Guided Bend Test
17. Single V-Groove Weld, Butt Joint, Vertical Up
18. Single V-Groove Weld, Butt Joint, Flat
19. Single V-Groove Weld, Butt Joint, Overhead
20. Fillet Welds, Lap and T-Joints, Horizontal
21. Fillet Welds, Lap and T-Joints, Vertical Down
22. Fillet Welds, Lap Joints, Flat
23. Fillet Welds, Lap Joints, Horizontal
24. Single V-Groove Weld, Flat

COURSE OBJECTIVES

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

1. Gas Metal Arc Welding Basic, Course Overview
a.Demonstrate entry level welding skills.
2. Introduction to Gas Metal Arc Welding
a.Explain GMAW operating principles.
b.Describe the types of metal transfer.
3. Safety and Health of Welders
a.Demonstrate safe work practices.
b.Recognize unsafe work conditions.
4. Equipment Setup and Maintenance
a.Describe gun cable assemblies.
b.Operate correct amperage and voltage settings.
c.Perform correct equipment shutdown and clean up procedures.
5. Surfacing Welds, Flat
a.Assemble three pieces of mild steel plate.
b.Produce quality surfacing welds using the flat welding position.
6. Square Groove and Fillet Welds, Flat
a.Construct butt, lap and t-joints using mild steel.
b.Produce quality square groove and fillet welds using the flat welding position.
7. Square Groove and Fillet Welds, Horizontal
a.Construct butt, lap and t-joints using mild steel.
b.Produce quality square groove and fillet welds using the horizontal welding position.
8. The Quality of Welds
a.Discuss the gas metal arc welding process variables and their effect on the quality of welds.
9. Square Groove and Fillet Welds, Vertical Down
a.Construct butt, lap and t-joints using mild steel.
b.Produce quality square groove and fillet welds using the vertical down welding position.
10. Square Groove and Fillet Welds, Vertical Up

a.Assemble butt, lap and t-joints using mild steel.
b.Produce quality square groove and fillet welds using the vertical up welding position.
11. Metal Transfer and Shielding Gases
a.Explain the three types of metal tranfer.
b.Define reactive and inert gases.
12. Square Groove and Fillet Welds, Overhead
a.Construct butt, lap and t-joints using mild steel.
b.Produce quality square groove and fillet welds using the overhead welding position.
13. Single V-Groove Weld, Butt Joint, Horizontal
a.Construct single v-groove butt joints on mild steel.
b.Produce quality single v-groove welds using the horizontal welding position.
14. Single V-Groove Weld, Horizontal, Guided Bend Test
a.Produce a quality single v-groove weld in the horizontal welding position.
b.Perform a visual inspection.
c.Perform a guided bend test.
15. Single V-Groove Weld, Butt Joint, Vertical Down
a.Construct a single v-groove butt joint using mild steel.
b.Produce quality single v-groove welds using the vertical down welding position.
16. Single V-Groove Weld, Vertical Down, Guided Bend Test
a.Produce a quality single v-groove weld using the vertical down welding position.
b.Perform a visual inspection.
c.Perform a guided bend test.
17. Single V-Groove Weld, Butt Joint, Vertical Up
a.Construct a single v-groove butt joint using mild steel.
b.Produce quality single v-groove welds using the vertical up welding position.
18. Single V-Groove Weld, Butt Joint, Flat
a.Construct a single v-groove butt joint using mild steel.
b.Produce quality single v-groove welds using the flat welding position.
19. Single V-Groove Weld, Butt Joint, Overhead
a.Construct a single v-groove butt joint using mild steel.
b.Produce quality single v-groove welds using the overhead welding position.
20. Fillet Welds, Lap and T-Joints, Horizontal
a.Assemble lap and t-joints using mild steel.
b.Produce quality fillet welds using the horizontal welding position.
21. Fillet Welds, Lap and T-Joints, Vertical Down
a.Assemble lap and t-joints using mild steel.
b.Produce quality fillet welds using the vertical down welding position.
22. Fillet Welds, Lap Joints, Flat
a.Construct lap joints using mild steel.
b.Produce quality fillet welds using spray transfer utilizing the flat welding position.
23. Fillet Welds, Lap Joints, Horizontal
a.Construct lap joints using mild steel.
b.Produce quality fillet welds using spray transfer utilizing the horizontal welding position.
24. Single V-Groove Weld, Flat
a.Construct a single v-groove butt joint with backing strip using mild steel.
b.Produce quality single v-groove welds using spray transfer utilizing 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	☐ 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
- ☐ Readings
- ☐ Service learning
- ☐ Student and instructor conferences
- ☐ Student presentation
- ☑ Tests or quizzes
- ☐ Writing assignments/exercises (graded or not)
- ☐ Other (please list specifics):
- ☐ Peer review
- ☐ Role play
- ☑ Simulation
- ☐ Student collaborative learning
- ☑ 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: