

Washtenaw Community College Comprehensive Report

WAF 117 Ironworker Pre-Apprenticeship Flux Cored Arc Welding Effective Term: Fall 2020

Course Cover

Division: Advanced Technologies and Public Service Careers

Department: Welding and Fabrication

Discipline: Welding and Fabrication

Course Number: 117

Org Number: 14600

Full Course Title: Ironworker Pre-Apprenticeship Flux Cored Arc Welding

Transcript Title: IW Pre-Apprenticeship FCAW

Is Consultation with other department(s) required: No

Publish in the Following: College Catalog , Web Page

Reason for Submission: Course Change

Change Information:

Course title

Course description

Pre-requisite, co-requisite, or enrollment restrictions

Outcomes/Assessment

Objectives/Evaluation

Rationale: This course is being updated to better align with the Ironworkers Pre-Apprentice Certificate.

Proposed Start Semester: Winter 2020

Course Description: In this course, students will be introduced to the Flux-Cored Arc Welding (FCAW) process and gain the understanding of how this process is applied in the Ironworker trade. Students will learn to apply FCAW to various joint designs, on plate and structural shapes in multiple positions, using self-shielded and gas shielded filler wire. Welding vocabulary, welding theory, basic electricity, personal protective equipment (PPE), equipment troubleshooting, welding symbols, safety precautions and safe work practices will be covered along with discussing the various consumables used in FCAW and their applications. The title of this course was previously Flux Cored Arc Welding for Ironworkers. This course is required for the Ironworkers Pre-Apprenticeship Certificate.

Course Credit Hours

Variable hours: No

Credits: 4

Lecture Hours: Instructor: 30 Student: 30

Lab: Instructor: 90 Student: 90

Clinical: Instructor: 0 Student: 0

Total Contact Hours: Instructor: 120 Student: 120

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

Reduced Reading/Writing Scores

College-Level Math

No Level Required

Requisites

Prerequisite minimum grade "C"

WAF 110

and

Prerequisite minimum grade "C"

WAF 114

and

Prerequisite

Academic Reading Level 3, Academic Writing Level 2

General Education

Degree Attributes

Below College Level Pre-Reqs

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Set up equipment, and perform a Flux-Cored Weld on plate.

Assessment 1

Assessment Tool: Student project

Assessment Date: Winter 2023

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 70% of students will achieve 70% or higher.

Who will score and analyze the data: Departmental faculty

2. Demonstrate proper welding processes to complete a welded project as specified on a blueprint.

Assessment 1

Assessment Tool: Student project

Assessment Date: Winter 2023

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Departmentally-developed rubric

Standard of success to be used for this assessment: 70% of students will perform 70% or higher.

Who will score and analyze the data: Departmental faculty

3. Identify proper terms, materials, safety and applications for the Flux Cored Arc Welding processes.

Assessment 1

Assessment Tool: Outcome-related exam questions

Assessment Date: Winter 2023

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key

Standard of success to be used for this assessment: 70% of students will achieve 70% or higher.

Who will score and analyze the data: Departmental faculty

Course Objectives

1. Unit 1 Flux Cored Arc Welding Overview: Identify the basic principles of both gas shielded and self-shielded flux cored wire.
2. Unit 2 FCAW Safety: Identify safety hazards and proper safety equipment for the Flux-Cored Arc Welding (FCAW) process.
3. Unit 3 Electricity: Explain the basics of electricity including the different polarities for the FCAW process.
4. Unit 3 Electricity: Differentiate between various types of power sources and types of power source outputs.
5. Unit 4 FCAW Equipment: Identify the basic equipment needed for FCAW, and differentiate between various FCAW power sources and machines.
6. Unit 5 FCAW Consumables: Identify the characteristics of both FCAW self-shielded (FCAW-SS) and FCAW gas-shielded (FCAW-GS) electrodes.
7. Unit 5 FCAW Consumables: Identify the characteristics of metal-cored wires and shielding gases.
8. Unit 6 FCAW Minor Maintenance and Repair: Demonstrate ability to troubleshoot and repair the FCAW equipment.
9. Unit 7 FCAW Equipment Setup: Demonstrate ability to set up and adjust proper settings for the FCAW welding process.
10. Unit 8 The FCAW Process: Explain the FCAW-GS and FCAW-SS processes.
11. Unit 8 The FCAW Process: Describe specific variables to be set when welding in the FCAW process.
12. Unit 8 The FCAW Process: Demonstrate ability to form and terminate a weld bead in the FCAW process.
13. Unit 9 FCAW Quality: Evaluate the quality of a weld made with the FCAW process.
14. Unit 9 FCAW Quality: Troubleshoot the FCAW Process.

New Resources for Course

Course Textbooks/Resources

Textbooks

International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers. *Flux Cored Arc Welding*, ed. International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers, 2016

International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers. *Welding for Ironworkers - Student Workbook*, ed. International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers, 2016

Manuals

Periodicals

Software

Equipment/Facilities

Level III classroom

Reviewer

Faculty Preparer:

Amanda Scheffler

Department Chair/Area Director:

Glenn Kay II

Dean:

Brandon Tucker

Curriculum Committee Chair:

Lisa Veasey

Action

Faculty Preparer

Recommend Approval

Recommend Approval

Recommend Approval

Date

Nov 08, 2019

Nov 08, 2019

Dec 10, 2019

Feb 03, 2020

Assessment Committee Chair:

Shawn Deron

Recommend Approval

Feb 11, 2020

Vice President for Instruction:

Kimberly Hurns

Approve

Feb 14, 2020

Washtenaw Community College Comprehensive Report

WAF 117 Flux Cored Arc Welding for Ironworkers Effective Term: Fall 2016

Course Cover

Division: Advanced Technologies and Public Service Careers

Department: Welding and Fabrication

Discipline: Welding and Fabrication

Course Number: 117

Org Number: 14600

Full Course Title: Flux Cored Arc Welding for Ironworkers

Transcript Title: FCAW for Ironworkers

Is Consultation with other department(s) required: No

Publish in the Following: College Catalog , Web Page

Reason for Submission: New Course

Change Information:

Rationale: The Ironworker's Union requested a pre-apprenticeship certificate to assist them in obtaining more qualified candidates prior to entering into their apprenticeship training program.

Proposed Start Semester: Fall 2016

Course Description: In this course, students will be introduced to the Flux Cored Arc Welding (FCAW) process and gain the understanding of how this process is applied in the Union Ironworker Trade. Students will learn to apply FCAW to various joint designs, on carbon steel plates and structural shapes in multiple positions, using self-shielded and gas shielded filler wire. Welding vocabulary, welding theory, basic electricity, personal protective equipment (PPE), equipment troubleshooting, welding symbols, safety precautions and safe work practices will be covered along with discussing the various consumables used in FCAW and their applications. This class is a required part of the regional Ironworker Local Union pre-apprentice certificate.

Course Credit Hours

Variable hours: No

Credits: 4

Lecture Hours: Instructor: 30 Student: 30

Lab: Instructor: 90 Student: 90

Clinical: Instructor: 0 Student: 0

Total Contact Hours: Instructor: 120 Student: 120

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Requisites

General Education

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Safely set up equipment and perform a Flux-Cored Weld on carbon steel plate.

Assessment 1

Assessment Tool: Welded plate

Assessment Date: Fall 2017

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Departmentally-developed rubric based on Iron Worker's Union quality acceptance criteria

Standard of success to be used for this assessment: 80% of students will achieve 80% or higher.

Who will score and analyze the data: Departmental faculty

2. Identify and apply proper welding processes to complete a welded project as specified on a blueprint.

Assessment 1

Assessment Tool: Welded project

Assessment Date: Fall 2017

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Departmentally-developed rubric based on Iron Worker's Union quality acceptance criteria

Standard of success to be used for this assessment: 80% of students will perform 80% or higher.

Who will score and analyze the data: Departmental faculty

3. Identify proper terms, materials, safety issues and applications for cored filler arc welding processes.

Assessment 1

Assessment Tool: Written exam

Assessment Date: Fall 2017

Assessment Cycle: Every Three Years

Course section(s)/other population: All

Number students to be assessed: All

How the assessment will be scored: Answer key and departmentally-developed rubric based on Iron Worker's Union quality acceptance criteria

Standard of success to be used for this assessment: 80% of students will achieve 80% or higher.

Who will score and analyze the data: Departmental faculty

Course Objectives

1. Trace early history of the Flux Cored Welding and Metal Cored Arc Welding processes.
2. Identify various FCAW/MCAW blueprint symbols.
3. Identify various weld joints used with the FCAW and MCAW processes.
4. Explain the principles and applications of the FCAW process with gas shielded and self shielded electrodes.
5. Explain the principles and applications of the MCAW process.
6. Demonstrate proper set-up on welding equipment for cored filler metals and identify potential safety hazards.
7. Demonstrate minor maintenance procedures on FCAW and MCAW equipment.

8. Explain basic electrical theories and how they apply to the FCAW and MCAW processes.
9. Identify FCAW and MCAW equipment and power source selection.
10. Identify FCAW consumables and identify the effects of shielding gases.
11. Identify MCAW consumables and identify the effects of shielding gases.
12. Demonstrate minor maintenance procedures on FCAW/MCAW equipment.
13. Properly initiate, form and terminate beads with the FCAW and MCAW processes.
14. Weld a butt, lap and tee weld on various thicknesses of mild steel plate with the FCAW processes.
15. Weld a butt, lap and tee weld on various thicknesses of mild steel plate with the MCAW processes.
16. Evaluate FCAW welds and troubleshoot issues.
17. Evaluate MCAW welds and trouble shoot issues.

New Resources for Course

Course Textbooks/Resources

Textbooks

Manuals

International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers. Flux Cored Arc Welding, International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers, 06-01-2015

International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers. Welding for Ironworkers Student Workbook, International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers, 06-01-2015

Periodicals

Software

Equipment/Facilities

<u>Reviewer</u>	<u>Action</u>	<u>Date</u>
Faculty Preparer: <i>Amanda Scheffler</i>	<i>Faculty Preparer</i>	<i>Dec 01, 2015</i>
Department Chair/Area Director: <i>Glenn Kay II</i>	<i>Recommend Approval</i>	<i>Dec 08, 2015</i>
Dean: <i>Brandon Tucker</i>	<i>Recommend Approval</i>	<i>Dec 14, 2015</i>
Curriculum Committee Chair: <i>Kelley Gottschang</i>	<i>Recommend Approval</i>	<i>Jan 21, 2016</i>
Assessment Committee Chair: <i>Michelle Garey</i>	<i>Recommend Approval</i>	<i>Jan 25, 2016</i>
Vice President for Instruction: <i>Michael Nealon</i>	<i>Approve</i>	<i>Jan 25, 2016</i>