Course Outline

2026-2027 Catalog

WLD 36 - Welder Qualification

Catalog Description

Transfer Status: CSU

Prerequisite: WLD 22, WLD 24, WLD 25, WLD 26, WLD 40, WLD 50, WLD 154 and NCCER Level II Welding Qualification

Corequisite: WLD 28, WLD 30, WLD 32, WLD 34, WLD 42, WLD 56, WLD 156

Unit(s): 3.00

Lecture: 17.00 Contact hours/34.00 Out of class hours/51.00 Total hours/1.00 Unit(s)

Lab: 102.00 Contact hours/0.00 Out of class hours/102.00 Total hours/2.00 Unit(s)

Total: 119.00 Contact hours/34.00 Out of class hours/153.00 Total hours/3.00 Unit(s)

Course Description: This course prepares students for qualifications in several codes to meet the required standards for entry-level employment. Training in shielded metal arc welding (SMAW), gas tungsten arc welding (GTAW), gas metal arc welding (GMAW), and flux core arc welding (FCAW) to meet the American Welding Society (AWS), American Petroleum Institute (API), and American Society of Mechanical Engineers (ASME) code standards. Skills and proficiencies of all positions qualification test on plate and pipe are emphasized.

Objectives

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

1. Apply qualification procedures in the previously developed training processes for groove and fillet welds.
2. Apply qualification procedures in several codes to meet the required standard for entry-level employment.
3. Complete welder qualification tests using various codes, filler materials, base materials, and welding processes.

Course Content

Topic Titles / Suggested Time Topic

Lecture

Topics	Lec Hrs
Introduction and safety	2.00
Base metal and its preparation a. Flat b. Horizontal c. Vertical d. Overhead e. Design and preparation of a joint for production welding	0.50
Groove plate tests welds a. 1g (flat) b. 2g (horizontal) c. 3g (vertical) d. 4g (overhead)	1.00
Fillet welds AWS specification a. 1G (flat) b. 2G (horizontal) c. 3G (vertical) d. 4G (overhead)	0.50
Test specimens: number, type and preparation a. Complete joint penetration groove welds b. Non destructive testing c. Mechanical testing d. Partial Joint Penetration groove welds e. Fillet welds	1.00
Method of testing specimens a. Reduced--section tension specimens b. Macro-etch test c. Root, face, and side bend specimens d. All-weld metal tension test	1.00
Total Hours:	**17.00**

Topics	Lec Hrs
Qualification of welders and welding operations a. Performance qualification requirements b. The test specimen c. Testing of qualification weld d. Qualification records e. Standardization of tests f. Retests	2.00
AR 1-2-3 level of welder qualification a. Visual inspection b. Radiographic inspection (optional) c. Bend test d. Macrostructive examination e. Re test and re-qualification f. Fabricators records	1.50
Welder qualification for API 1104	1.00
Welder qualification for ASME section IX	1.00
Qualification for other AWS welding codes (D1.5, D1.8, D10.4-66)	1.00
Review for Welder Qualification	1.00
Procedure and performance qualification	0.50
Limitations and variables of AWS welding code a. SMAW b. GTAW c. FCAW e. GMAW	1.00
Types of test and purpose a. groove welds b. fillet welds	1.00
Welding of dissimilar materials	1.00
Total Hours:	**17.00**

Lab

Topics	Lab Hrs
Introduction and safety	2.00
Procedure and performance qualification	3.00
Base metal and its preparation	7.00
Limitations and variables of AWS welding code	2.00
Types of test and purpose	7.00
Qualification of welders and welding operations	8.00
Groove plate test welds	12.00
Fillet welds AWS specification	3.00
Test specimens – number, type, and preparation	7.00
Methods of testing specimens	6.00
Welding of dissimilar materials	6.00
AR 1-2-3 level of welder qualification	8.00
Welder qualification for ASME section IX	12.00
Welder qualification for API 1104	6.00
Qualification for other AWS welding codes (D1.5, D1.8, D10.4-66)	6.00
Review for Welder Qualification	7.00
Total Hours:	**102.00**

Methods of Instruction

A. Demonstrations
B. Discussion
C. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
D. Instructor Demonstrations
E. Laboratory Experiments
F. Lecture

G. Multimedia Presentations

Methods of Evaluation

A. Exams/Tests
B. Quizzes
C. Homework
D. Lab Projects
E. Lab Mid-term Project, Lab Final Project

Examples of Assignments

Reading Assignments

1. Read module 6 and be prepared to discuss in class.
2. Read assigned AWS journal article and be prepared to discuss in class.

Writing Assignments

1. Write an essay explaining how the assigned AWS article can be implemented into the process and how it relates to the class.
2. Describe an order of operations for the welding of two dissimilar materials.

Out-of-Class Assignments

1. Compare and contrast the welder qualification standards for the two welding codes assigned.
2. Answer review questions for module 2.

Recommended Materials of Instruction

AWS Committee on Methods of Inspection. (2000). Welding Inspection. *American Welding Society, 3rd.*
National Center for Construction Education and Research (NCCER). (2010). Welding Level Three. *Pearson Education INC, 4th.*
National Center for Construction Education and Research (NCCER). (2010). Welding Level Two. *Pearson Education INC, 4th.*

Other Learning Materials

All tools listed in the Butte College Welding Technology Program Guide.

Minimum Qualifications

Welding

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