Course Outline

2026-2027 Catalog

WLD 40 - Welding Equipment Maintenance and Service

Catalog Description

Transfer Status: CSU

Prerequisite: WLD 21 and NCCER Level I Welding Qualification

Unit(s): 2.00

Lecture: 17.00 Contact hours/34.00 Out of class hours/51.00 Total hours/1.00 Unit(s)
Lab: 51.00 Contact hours/0.00 Out of class hours/51.00 Total hours/1.00 Unit(s)
Total: 68.00 Contact hours/34.00 Out of class hours/102.00 Total hours/2.00 Unit(s)

Course Description: This course is a study of the theory, application and practices for welding equipment. This will include the maintenance and service skills for the equipment used in the welding industry.

Objectives

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

1. Demonstrate electrical theory used in welding by setting up and operating various types of power sources.
2. Service and maintain welding equipment during hands-on exercises.
3. Identify and explain the functions, components, and operating procedures of common welding machines and equipment.
4. Make minor repairs and troubleshoot welding equipment through hands on lab assignments.

Course Content

Topic Titles / Suggested Time Topic

Lecture

Topics	Lec Hrs
Introduction and safety	2.00
Welding processes	1.00
Allied processes	1.00
Operating principles	1.00
Power sources	1.00
Constant current machines	1.00
Constant voltage machines	1.00
Power supply rating	1.00
Cables, fasteners, electrode holders and ground clamps	1.00
Wire feed units	1.00
Operator equipment	1.00
Gas welding equipment	2.00
Gas tungsten arc welding (GTAW) torches and accessories	1.00
Portable equipment (arc welders)	1.00
Equipment sales	1.00
Total Hours:	**17.00**

Lab

Topics	Lab Hrs
Introduction and safety	3.00
Welding processes	3.00
Allied processes	3.00
Operating principles	3.00
Power sources	6.00
Constant current machines	6.00
Constant voltage machines	3.00
Power supply rating	3.00
Cables, fasteners, electrode holders and ground clamps	2.00
Wire feed units	2.00
Operator equipment	2.00
Gas welding equipment	6.00

Topics	Lab Hrs
GTAW torches and accessories	3.00
Portable equipment (arc welders)	3.00
Equipment sales	3.00
Total Hours:	**51.00**

Methods of Instruction

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

Methods of Evaluation

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

Examples of Assignments

Reading Assignments

1. Read assigned equipment manual and be prepared to discuss in class.
2. Read assigned American Welding Society (AWS) journal article and be prepared to discuss in class.

Writing Assignments

1. Write a 500-word essay explaining how the assigned equipment manuals can be implemented into the process and how it relates to the class.
2. Describe an order of operations for equipment setup.

Out-of-Class Assignments

1. Research the proper process for setting up equipment using manufactures publication.
2. Answer review questions for chapter 2.

Recommended Materials of Instruction

National Center for Construction Education and Research (NCCER). (2025). Welding Level Two. *Pearson, 6th.* 9780138216160.
National Center for Construction Education and Research (NCCER). (2023). Welding Level One. *Pearson, 6th.* 9780137924530.
Michael J. Boss. (1996). Welding Equipment Maintenance and Service Lab Manual. *Butte College Printing, ...*

Other Learning Materials

All tools listed in the Full-Time Welding Program Semester 1 tool list on the Butte College Welding Technology website.

Minimum Qualifications

Welding

Created/Revised by: Armitage, Chris
Date: 04/20/2026