



Course Outline

2026-2027 Catalog

WLD 50 - Pipe Fitting and Cutting

Catalog Description

Transfer Status: CSU

Prerequisite: WLD 22, WLD 24, WLD 25, WLD 26, WLD 40, WLD 154 and NCCER Level II 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 assists students in pipe fitting, measurements, patterns, marking and layout tools used in the pipe welding industry. Techniques of fitting and cutting various pipe joint designs will be practiced.

Objectives

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

1. Correctly utilize the tools in pipe layout and fitting correctly.
2. Layout various pipe joint designs.
3. Cut and prepare to weld various pipe joint designs.
4. Lay out and cut eccentric and concentric reducers.

Course Content

Topic Titles / Suggested Time Topic

Lecture

Topics

Lec Hrs

Introduction and safety	2.00
Definitions (terms used in the pipe trade)	0.50
Basic trade math	0.50
Patterns	1.00
a. methods of laying out angles(formula)	
b. pre-made patterns	
Measurements	1.00
Reducers	1.00
Layout drawings	0.50
Tools	0.50
Pipe and fitting layouts	1.00
Cutting	0.50
Offsets	0.50
Trigonometry tables	1.00
Pipe sizes	0.50
Pipe bends	0.50
Miter turn fittings	0.50
Brackets	0.50
Linear expansion of piping	1.00
Conversion factors, table and graphs	1.00
Properties of pipe	1.00
Weight and volume	1.00
Cutting torch	1.00

Total Hours: 17.00

Lab

Topics

Lab Hrs

Basic trade math	2.00
Patterns	4.00

Topics	Lab Hrs
a. methods of laying out angles(formula)	
b. pre-made patterns	
Measurements	3.00
Reducers	3.00
Layout drawings	5.00
Tools	2.00
Pipe and fitting layouts	5.00
Cutting	2.00
Offsets	2.00
Trigonometry tables	2.00
Pipe sizes	2.00
Pipe bends	2.00
Miter turn fittings	2.00
Brackets	2.00
Linear expansion of piping	3.00
Conversion factors, table and graphs	3.00
Properties of pipe	2.00
Weight and volume	2.00
Cutting torch	3.00
Total Hours:	51.00

Methods of Instruction

- A. Demonstrations
- B. Discussion
- C. Guest Speakers
- D. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- E. Instructor Demonstrations
- 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 the layout procedures used for a three weld ninety 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 an essay explaining how the assigned United Association article can be implemented into the process and how it relates to the class.
2. Describe an order of operations for laying out a branch assembly.

Out-of-Class Assignments

1. Research the proper process for setting up OFC equipment using manufactures publication.
2. Draw a template for an eccentric pipe reducer.

Recommended Materials of Instruction

Thomas W. Frankland. (1967). Pipe Template Layout. -, *Most Current*.

Frankland, T. (1984). The Pipe Fitter's and Pipe Welder's Handbook. *GLENCOE - McGraw-Hill*.

Turns, Tube Inc. (1989). Pipe Fitter's Manual. *Turns, Tube Inc.*

National Center for Construction Education and Research (NCCER). (2010). Welding Level Two. *Pearson Education INC, 4th*.

National Center for Construction Education and Research (NCCER). (2010). Welding Level One. *Pearson Education INC, 4th*.

Other Learning Materials

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

Minimum Qualifications

Welding

Created/Revised by: Robinson, Donald

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