

Las Positas College
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Course Outline for WLDT 69B

ADVANCED PIPE WELDING

Effective: Spring 2018

I. CATALOG DESCRIPTION:

WLDT 69B — ADVANCED PIPE WELDING — 3.00 units

Theory and practical application of: pipe joint preparation and design, API (American Petroleum Institute) and AWS (American Welding Society) welding codes specification for pipe and pipe fittings, analysis of joint configuration, plasma and flame cutting of pipes, wire and electrodes selections, beginning of pipe welding blue print and welding symbols, SMAW, GMAW, FCAW and GTAW of pipe joints, non-destructive and destructive test and qualitative concepts of evaluation. Welding in the 5G and 6G positions.

1.00 Units Lecture 2.00 Units Lab

Prerequisite

WLDT 69A - Beginning Pipe Welding
 with a minimum grade of C

Grading Methods:

Letter or P/NP

Discipline:

- Welding

	MIN
Lecture Hours:	18.00
Lab Hours:	108.00
Total Hours:	126.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering the course a student should be able to:

A. WLDT69A

IV. MEASURABLE OBJECTIVES:

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

- Identify and understand the API and AWS codes specifications;
- Interpret blueprint concepts in practical welding applications;
- Apply and properly join, fit up and align pipe welding joints;
- Employ and manually cut pipe joints using plasma, oxy-fuel and gouging equipment in accordance with manufacturing standards;
- Demonstrate welding of pipe to code specification with proper techniques in non-rotated 5G and 6G position using SMAW, GMAW, FCAW and GTAW processes;
- Identify welding pipe discontinuities and defects;
- Explain destructive and non-destructive welding test evaluations;
- Report on welder performance tests in 5G and 6G positions using one of the four welding processes mentioned above.

V. CONTENT:

- Welding codes and specifications
 - API Code
 - AWS Code
- Advanced blueprints as used in pipe welding
 - Welding symbols
 - Orthographic
 - Isometric
 - Piping symbols
 - Assembly
 - Details
 - Weld mapping
- Welded pipe
 - Typical joints

2. Material prep
3. Fit up
4. Alignment
5. Tack welds
6. Purging
- D. Cutting pipe
 1. Plasma
 2. Oxy-fuel
 3. Gouging
 4. Saws
 5. Machined
- E. Weld pipe to code specification with proper techniques
 1. 5G fixed
 2. 6G fixed
 3. SMAW
 4. GMAW
 5. GTAW
 6. FCAW
- F. Advanced pipe welding inspection
 1. Discontinuities
 2. Cause
 3. Corrective action
- G. Advanced welding test evaluation
 1. Non destructive testing
 2. Destructive testing
 3. Hydrostatic testing
- H. Welder performance tests
 1. 5G fixed
 2. 6G fixed

VI. METHODS OF INSTRUCTION:

- A. **Observation and Demonstration** -
- B. **Lecture** -
- C. **Field Trips** -
- D. **Demonstration** -
- E. Videos

VII. TYPICAL ASSIGNMENTS:

- A. Prepare the pipe ends to be welded
- B. Fit together the pipes in accordance with the welding procedure
- C. Execute welds in 6G position
- D. Prepare to discuss weld defects, discontinuities and other quality requirements

VIII. EVALUATION:

A. **Methods**

1. Exams/Tests
2. Quizzes
3. Class Participation
4. Class Work
5. Home Work
6. Lab Activities

B. **Frequency**

1. Final exam end of course
2. Quizzes biweekly
3. Class participation daily
4. Class work evaluations daily
5. Homework assignments weekly
6. Performance of laboratory task list of assignments and projects as assigned

IX. TYPICAL TEXTS:

1. Althouse, A., Turnquist, C., Bowditch, W., Bowditch, K., & Bowditch, M. (2013). *Modern Welding* (11th ed.). Tinley Park , IL: Goodheart-Willcox Company.
2. American Welding Society (2012). *SPECIFICATION FOR WELDING PROCEDURE AND PERFORMANCE QUALIFICATION* (2012 ed.). Miami, Florida: American Welding Society.
3. American Welding Society (2015). *Structural Welding Code - Steel* (2015 ed.). Miami, Florida: American Welding Society.
4. Jeffus, L., & Baker, B. (2017). *Pipe Welding* (1st ed.). Boston, MA: Cengage Learning.
5. Brown, W., & Brown, R. (2016). *Print Reading for Industry* (10th ed.). Tinley Park , IL: Goodheart-Willcox Company.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

- A. Welding protective clothing
- B. Welding gloves
- C. Welding goggles
- D. Welding helmet
- E. Welding safety glasses
- F. Welding jacket
- G. Welding boots