

Lassen Community College Course Outline

WT-44 Gas Metal Arc Welding

3.0 Units

I. Catalog Description

This course is designed as an elective class to develop the manipulative skills, technical knowledge and application of the gas metal arc welding (GMAW) spray transfer process and flux core arc welding with gas (FCAW-G). The processes will be applied to recognized joint designs on ferrous materials. GMAW will also be explored in welding nonferrous materials (aluminum). Repeatable as required for qualification by the American Welding Society (AWS) D1.1, Section 4.1.3. (Instructor Authorization Required for Course Repetition.)

Transfers to CSU only

153 Hours Lab, 153 Total Student Learning Hours

Scheduled:

II. Coding Information

Repeatability: Not repeatable

Grading Option: Graded or Pass/No Pass

Credit Type: Credit - Degree Applicable

TOP Code: 095650

III. Course Objectives

A. Course Student Learning Outcomes

Upon completion of this course the student will be able to:

1. Safely setup and perform a minimum of ten welds for each of the welding positions using ER70S .035” electrodes. Welds shall meet or exceed the AWS D1.1 Structural Welding Code standards, using GMAW spray transfer on steel.
2. Safely setup and perform a minimum of ten welds for each of the welding positions, using FCAW-G. Welds shall meet or exceed the AWS D1.1 Structural Welding Code standards, using FCAW-G on steel.
3. Complete two GMAW and two FCAW-G AWS qualifications.

B. Course Objectives

Upon completion of this course the student will be able to:

1. Demonstrate safe handling and use of the GMAW and FCAW equipment.
2. Demonstrate the manipulative skills necessary to weld selected joint designs with the GMAW and FCAW process.
3. Demonstrate the manipulative skills necessary to weld ferrous and nonferrous materials with the GMAW process.

IV. Course Content

A. Safety Precautions

1. Electrical shock
2. Radiation hazards
3. Compressed gases

4. Air contamination
5. Emergency shop procedures
- B. GMAW/FCAW Setup**
 1. Contact tips
 2. Diffusers
 3. Filler metal selection
- C. GMAW/FCAW Power Source Settings**
 1. Polarity settings
 2. Amperage control
 3. Voltage control
 4. Wire speed
- D. GMAW/FCAW Flowmeter**
 1. Shielding gas selection
 2. Flowmeter components
 3. Flowmeter settings
- E. Establishing an Arc**
 1. Filler metal extension
 2. Welding gun angles
- F. Weld Bead Parameters**
 1. Bead width
 2. Penetration
 3. Ripple appearance
 4. Travel speed
 5. Push method
 6. Drag method
- G. Selected Joint Designs - Mild Steel**
 1. Flat
 2. T-joint - horizontal-2F
 3. T-joint - vertical-3F
 4. T-joint - overhead-4F
 5. Lap joint
- H. Selected Joint Designs - Aluminum**
 1. Flat
 2. T-joint - horizontal-2F
 3. T-joint - vertical-3F
 4. T-joint - overhead-4F

V. Assignments

A. Appropriate Readings

Standard text: "Welding Principles & Applications," and/or trade manuals will be primary sources of course readings. Additional information sources will include product and use guides from industry manufacturers to enhance the learning process.

B. Writing Assignments

Students will apply technical skills and understanding of course content by demonstrating application of the GMAW and FCAW process on specific joint designs which meet welding department specifications.

C. Expected Outside Assignments

None

D. Specific Assignments that Demonstrate Critical Thinking

Students will be required to demonstrate an understanding of GMAW and FCAW concepts and practices by applying the technical information to multiple manipulative performance objectives which meet welding department specifications.

VI. Methods of Evaluation

Methods for determining student grades will be accomplished by the following:

1. Completion of required manipulative performance objectives and projects.
2. Participation in classroom learning activities.

VII. Methods of Delivery

Check those delivery methods for which, this course has been separately approved by the Curriculum/Academic Standards Committee.

- Traditional Classroom Delivery Correspondence Delivery
 Interactive Television Delivery Online Delivery

Demonstration/Laboratory

VIII. Representative Texts and Supplies

Jeffus, Larry; *Welding Principles & Applications*, 2017, 8th Edition, Delmar Cengage Learning, ISBN: 978-1-305-494695-5

Supplies: (required)

Gauntlet leather welding gloves
Safety glasses
Leather "logging type" boots
Cuffless, heavy cotton workpants, in good repair
Ear plugs, pliers w/cutters, and welding hat.

IX. Discipline/s Assignment

Welding Technology

X. Course Status

Current Status: Active
Original Approval Date: 2/27/1990
Revised By: Kory Konkol
Latest Curriculum/Academic Standards Committee Revision Date: 11/29/2022