Lassen Community College Course Outline

WT-45 Gas Tungsten Arc Welding 3.0 Units

I. Catalog Description

This is an elective course designed to develop the manipulative skill, technical knowledge and application of the gas tungsten arc welding (GTAW) process. The process will be applied to select joint designs on ferrous and nonferrous materials using the students off hand. Repeatable as required for qualification by the American Welding Society 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 fifteen American Welding Society (AWS) joint designs, which meet or exceed the AWS D1.1 Structural Welding Code standards, using GTAW on steel and aluminum.
2. Fabricate watertight and airtight joint designs on steel and aluminum, to welding shop standards, using the GTAW process.
3. Complete 3F, and 4F AWS qualifications on steel plate, using the GTAW process.

B. Course Objectives

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

1. Demonstrate safe handling and use of GTAW equipment.
2. Demonstrate the manipulative skills necessary to weld select joint designs with the GTAW process, which meet industry standards.

IV. Course Content

A. Safety Precautions
1. Electrical shock
2. Radiation hazards
3. Compressed gases
4. Air contamination
5. Emergency shop procedures

B. GTAW Torch Setup
1. Torch bodies
2. Collet bodies
3. Collet

4. Ceramic cups
5. Tails/caps
6. Tungsten electrodes

C. GTAW Power Source Settings
1. Polarity settings
2. Amperage control
3. Postflow settings
4. High frequency adjustments

D. GTAW Flowmeter
1. Shielding gas selection
2. GTAW flowmeter components
3. Flowmeter settings

E. Establishing an Arc
1. Assembling the GTAW torch
2. Tungsten electrode extension
3. Torch angle and distance from workpiece

F. Weld Bead Parameters
1. Bead width
2. Penetration
3. Ripple appearance
4. Travel speed

G. Selected Joint Designs - Mild Steel
1. Flat - no fill
2. Flat - fill
3. Closed butt - flat
4. Closed butt - vertical
5. T-joint - horizontal-2F
6. T-joint - vertical-3F

H. Selected Joint Designs - Stainless Steel
1. Flat - no fill
2. Flat - fill
3. Closed butt - flat
4. Closed butt - vertical
5. T-joint - horizontal-2F
6. T-joint - vertical-3F

I. Selected Joint Designs - Aluminum
1. Flat - no fill
2. Flat - fill
3. Closed butt - flat
4. Closed butt - vertical
5. T-joint - horizontal-2F
6. T-joint - vertical-3F

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 gas tungsten arc welding process on specific joint designs and material types which meet welding department specifications.

C. Expected Outside Assignments
None

D. Specific Assignments that Demonstrate Critical Thinking
Students will be required to demonstrate understanding of GTAW concepts and practices by applying the technical information to multiple manipulative performance objectives.

VI. Methods of Evaluation

Methods for determining student grades will be accomplished by the following:
1. Completion of required manipulative performance objectives.
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