

WELD 013A: INTRODUCTION TO GAS TUNGSTEN ARC WELDING

Originator

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Justification / Rationale

To align with AWS SENSE and create a sequence of courses that lead to an entry-level welder certificate demonstrating proficiency in welding and providing career options for students.

Effective Term

Fall 2020

Credit Status

Credit - Degree Applicable

Subject

WELD - Welding

Course Number

013A

Full Course Title

Introduction To Gas Tungsten Arc Welding

Short Title

INTRO GTAW WELDING

Discipline**Disciplines List**

Welding

Modality

Face-to-Face

Catalog Description

This course covers basic or beginning level GTAW welding. This course includes safe work practices, safety in the welding industry, welding equipment selection, beginning technical drawings used in the welding industry, measuring and cutting, the five basic welds, and thermal cutting processes including OFC and Plasma. Students will demonstrate the ability to weld the five basic welds (Butt, Lap, Outside corner, Tee, and Edge) in the horizontal and flat positions using the GTAW process.

Schedule Description

Introductory GTAW welding including the five basic welds in the flat and horizontal positions. Includes OFC and Plasma cutting.

Lecture Units

1

Lecture Semester Hours

18

Lab Units

1

Lab Semester Hours

54

In-class Hours

72

Out-of-class Hours

36

Total Course Units

2

Total Semester Hours

108

Required Text and Other Instructional Materials**Resource Type**

Book

Author

Jeffus, Larry

Title

Welding: Principles and Applications

Edition

8th

Publisher

Cengage Learning

Year

2016

College Level

Yes

Flesch-Kincaid Level

12

ISBN #

978-1305494695

Class Size Maximum

25

Course Content

Classroom introduction of the following:

- Setup of GTAW welding machine
- Proper tungsten preparation
- Proper filler material
- Proper grounding
- Fundamentals of arc welding
- Stringer beads
- Weave beads
- Multi-pass welds
- Joint preparation
- Safe working practices using cutting and welding tools
- Safe use cut-off saw
- Safe use of grinder for grinding and cutting

- Plasma cutting
- Oxy/acetylene cutting

Lab Content

Lab demonstration and practice of the following:

- Butt welds in the flat position
- Butt welds in the horizontal position
- Lap welds in the flat position
- Lap welds in the horizontal position
- Outside corner welds in the flat position
- Outside corner welds in the horizontal position
- T welds in the flat position
- T welds in the horizontal position
- Edge welds in the flat position
- Edge welds in the horizontal position

Course Objectives

	Objectives
Objective 1	Evaluate the gas tungsten arc welding process and the terms used to describe it and explain why the properties of tungsten make it a good electrode for the GTAW welding process.
Objective 2	Demonstrate how to shape the end of the tungsten electrode, how to clean the tungsten, and how to limit tungsten erosion and explain how tungsten contamination occurs, the symptoms of electrode contamination and the process for removing contamination.
Objective 3	Prepare a tungsten electrode using an electric grinder, choose the proper electrode type, and further prepare an electrode by melting into the preferred shape for a given alloy.
Objective 4	Experiment with nozzles and gas lenses, choose the proper shielding gasses, demonstrate the proper gas flow settings and choose the right current and polarity settings for various metals for a given GTAW weld.
Objective 5	Demonstrate proper GTAW butt joints, lap joints, and tee joints in the flat and horizontal positions applied to a specified standard. including the proper torch angle, proper cleaning of base metal, filler rod, and tungsten, keeping the filler inside the protective zone of the shielding gas while welding, and using proper pre-flow and post-flow of the shielding gas.
Objective 6	Demonstrate the ability to set up and use a plasma torch including proper grounding, proper airflow, and proper current for different thicknesses and types of metal including the proper use of consumables and the replacement of consumables.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Accurately measure, cut, fit and clean metal to prepare it for GTAW welding.
Outcome 2	Demonstrate proper welding techniques using GTAW equipment in the flat and horizontal positions including gas flow setup, amperage settings, proper torch distance, and torch angle.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Skilled Practice at a Workstation	Students are given assigned projects with accompanying technical drawings. The instructor assists students with symbols and other questions on the technical drawings. Students are expected to cut and prepare metal and to provide a good fit-up prior to final welding.
Self-exploration	Students are expected to read assigned chapters, answer chapter review questions, and be prepared for mid-term and final exams.
Lecture	The instructor uses Google Slides to provide direct instruction at the beginning of the scheduled class.
Discussion	During direct discussion, students are asked questions and discussion is encouraged including real-life scenarios.

Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
Written homework	Chapter reviews will be assessed by the instructor.	Out of Class Only
Laboratory projects	Student work samples are self-assessed and then are assessed by the instructor.	In Class Only
Presentations/student demonstration observations	Skill demonstration – lab work. Students will be assigned a series of shop projects to be completed in the shop.	In Class Only
Mid-term and final evaluations	Both mid-term and final are in multiple choice format	In Class Only
Student participation/contribution	Welding reflection packet and instructor evaluation. Students are expected to display good work habits, punctuality, and clean-up procedures.	In Class Only
Other	Participation	In Class Only

Assignments
Other In-class Assignments

1. Class discussion
2. Group interaction and presentation
3. Display proper work habits in shop
4. Display soft skills

Other Out-of-class Assignments

1. Reading assignments
2. Chapter review questions.
3. Students are encouraged to find opportunities outside of class time to research PPE and to practice welding to increase proficiency.

Grade Methods

Letter Grade Only

MIS Course Data
CIP Code

48.0508 - Welding Technology/Welder.

TOP Code

095650 - Welding Technology

SAM Code

C - Clearly Occupational

Basic Skills Status

Not Basic Skills

Prior College Level

Not applicable

Cooperative Work Experience

Not a Coop Course

Course Classification Status

Credit Course

Approved Special Class

Not special class

Noncredit Category

Not Applicable, Credit Course

Funding Agency Category

Not Applicable

Program Status

Program Applicable

Transfer Status

Not transferable

Allow Audit

No

Repeatability

No

Materials Fee

No

Additional Fees?

No

Files Uploaded

Attach relevant documents (example: Advisory Committee or Department Minutes)

Welding_Occupations_in_the_Inland_Empire Aug2018.pdf

Approvals**Curriculum Committee Approval Date**

9/03/2019

Academic Senate Approval Date

9/12/2019

Board of Trustees Approval Date

10/31/2019

Chancellor's Office Approval Date

12/02/2019

Course Control Number

CCC000609548

Programs referencing this course

Gas Tungsten Arc Welding Certificate (<http://catalog.collegeofthedesert.eduundefined?key=234/>)

Welding Technology SENSE Entry-Level Welder Certificate of Achievement (<http://catalog.collegeofthedesert.eduundefined?key=235/>)