

WELD 013B: INTERMEDIATE 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

013B

Full Course Title

Intermediate Gas Tungsten Arc Welding

Short Title

INTERM GTAW WELDING

Discipline**Disciplines List**

Welding

Modality

Face-to-Face

Catalog Description

This course covers intermediate level GTAW welding. This course includes safe work practices, safety in the welding industry, CNC plasma cutting processes, and the four positions of welding: Horizontal, Flat, Vertical, and Overhead. Student will demonstrate the ability to select the proper machine and settings and to perform the five basic welds in the four welding positions.

Schedule Description

This course covers intermediate level GTAW welding. This course includes safe work practices, safety in the welding industry, CNC plasma cutting processes, and the four positions of welding. Prerequisite: WELD 013A

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

Prerequisite Course(s)

WELD 013A

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

Entrance Skills

Student will accurately measure, cut, and fit metal to prepare it for GTAW welding. Student will demonstrate proper welding techniques using GTAW equipment in the flat and horizontal positions.

Requisite Course Objectives

WELD 013A-Describe the gas tungsten arc welding process and list the other terms used to describe it.

WELD 013A-Explain what makes tungsten a good electrode.

WELD 013A-Tell how tungsten erosion can be limited.

WELD 013A-Tell how to shape the end of the tungsten electrode and how to clean it.

WELD 013A-Discuss how the various types of tungsten electrodes are used.

WELD 013A-Demonstrate how to grind a point on a tungsten electrode using an electric grinder.

WELD 013A-Demonstrate how to remove a contaminated tungsten end.

WELD 013A-Demonstrate how to melt the end of the tungsten electrode into the desired shape.

WELD 013A-Discuss how to choose the appropriate nozzle for the job.

WELD 013A-Tell what procedures must be followed to get an accurate reading on a flowmeter.

Course Content

Classroom introduction of the following:

- Setup of GTAW welding machine
- Proper tungsten preparation
- Proper filler material
- Stringer beads
- Weave beads
- Multi-pass welds
- Joint preparation
- Setup of GMAW welding machine
- 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 vertical position
- Lap welds in the vertical position
- Outside corner welds in the vertical position
- T welds in the vertical position
- Edge welds in the vertical position

Course Objectives

	Objectives
Objective 1	Demonstrate how a welding joint in pipe is prepared for welding, apply a hot pass. and further weld the full sequence of welds including root, fill and cap.
Objective 2	Analyze the four most common root defects and determine the cause of each defect.
Objective 3	Compare the advantages and disadvantages of mechanical or destructive and nondestructive testing and determine why and when welds are tested.
Objective 4	Evaluate a weld according to a given standard or code.
Objective 5	Using the proper filler metal prefixes and interpreting the standard filler metal numbering system, plan how and when to use each type of filler metal.
Objective 6	Analyze the effects alloys and heat have on ferrous and other metals.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Demonstrate proper welding techniques using GTAW welding equipment in the vertical position including multiple passes used in pipe welding.
Outcome 2	Demonstrate fabrication techniques including measuring, bending, cutting, and proper cleaning and other preparation techniques for GTAW welding.

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-world 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

CCC000609549

Programs referencing this courseGas 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/>)