WELD 013C: ADVANCED GAS TUNGSTEN ARC WELDING

New Course Proposal

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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

013C

Full Course Title

Advanced Gas Tungsten Arc Welding

Short Title

ADV GTAW WELDING

Discipline

Disciplines List
Welding

Modality

Face-to-Face

Catalog Description

This capstone course covers the necessary information, preparation, and application to prepare for the AWS Welding Certification in GTAW welding. The completion of the course will include the opportunity to prepare sample welds and written tests for certification in all positions.

Schedule Description

This course covers all the necessary information, preparation, and application to prepare for welding certification. Prerequisite: WELD 013B

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 013B

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
Accurately measure, cut, and fit metal to prepare it for welding. Student will demonstrate proper welding techniques using GMAW equipment in the flat and horizontal, and overhead positions. Student will prepare all sample welds for GMAW certification.

Requisite Course Objectives
WELD 013B-Describe the effects alloys have on ferrous metals.
WELD 013B-Explain how to interpret the standard filler metal numbering system.
WELD 013B-Explain the significance of the filler metal prefixes.
WELD 013B-Explain how and when to use each type of filler metal.
WELD 013B-Explain why welds are tested.
WELD 013B-Describe the difference between a mechanical or destructive and non destructive testing.
WELD 013B-Sketch a single V-groove and indicate the location and sequence of welds for each position.
WELD 013B-Explain the uses of a hot pass.
WELD 013B-List the four most common root defects and the cause of each defect.
WELD 013B-Describe how a pipe joint is prepared for welding.

WELD 013B-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.
WELD 013B-Evaluate a weld according to a given standard or code.

Course Content

Classroom introduction of the following:

- Setup of GTAW welding machine
- Proper tungsten preparation
- Proper filler material
- Proper grounding
- Advanced arc welding techniques
- 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 overhead position
- Lap welds in the overhead position
- Outside corner welds in the overhead position
- T welds in the overhead position
- Edge welds in the overhead position

Course Objectives

	Objectives
Objective 1	Evaluate weld specimens according to acceptance criteria for butt, lap, and tee joints and perform mechanical testing of weld specimens created by the student.
Objective 2	Demonstrate GTA welding skills needed to make acceptable welds in thin gauge mild steel, stainless steel, and aluminum in all positions.
Objective 3	Demonstrate GTA welding skills needed to make acceptable pipe welds in 2G, 5G, and 6G positions in mild steel, stainless steel, and aluminum pipe and tubing.
Objective 4	Compare the difference between qualification and certification and determine the appropriateness of each use for a given weld including the considerations used when selecting a code or standard.
Objective 5	Demonstrate proper maintenance for the major components of oxyfuel welding equipment.
Objective 6	Properly set up, light, adjust, extinguish, and disassemble oxyfuel welding equipment safely and demonstrate proper maintenance for the major components of oxyfuel welding equipment.
Objective 7	Demonstrate the ability to choose the correct filler metal and explain the criteria used to select proper filler material including the use of proper codes and standards.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Demonstrate proper welding techniques by preparing coupons in the five basic welds using GTAW welding equipment in the flat, horizontal, vertical and overhead positions to meet the standard for a certifiable weld.
Outcome 2	Prepare all sample welds for GTAW certification in each weld type and in each of the four positions.

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, specifically coupons used to assess weld quality. 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.

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 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 practice welding and prepare for certification.

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
1/05/2020

Course Control Number
CCC000611428

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/)