WELD 011C: ADVANCED SHIELDED METAL ARC WELDING

Originator

Rory Pratt

Co-Contributor(s)

Name(s)
Gutierrez, Enrique

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

011C

Full Course Title

Advanced Shielded Metal Arc Welding

Short Title

ADV SMAW 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 SMAW welding. The completion of the course will include the opportunity to test for AWS SMAW welding certifications in all positions as defined in the SENSE certification.

Schedule Description

This course covers all the necessary information, preparation, and application to prepare for welding certification. Prerequisite: WELD 011B

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 011B

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, demonstrate proper welding techniques using SMAW equipment in the flat and horizontal, and vertical positions. Student will demonstrate fabrication techniques including measuring, bending, and cutting.

Requisite Course Objectives
WELD 011B-Discuss three general categories of pipe welds, including how they are used and what type of weld root penetration and strength they require.
WELD 011B-Discuss the advantage of welded pipe
WELD 011B-Discuss the preparation needed before welding pipe.
WELD 011B-Explain the purpose of a hot pass
WELD 011B-Describe the purpose or a root, filler, and cove passes for a pipe weld.
WELD 011B-Describe the vertical fixed position and the advantages and disadvantages.
WELD 011B-Discuss how to make a weld in the horizontal fixed position.
WELD 011B-Describe the eye protection that should be used with flame cutting.
WELD 011B-Discuss the oxyfuel gas cutting process including fuel gases, metals, regulators, torches, and cutting tips.
WELD 011B-Demonstrate how to safely set up, light, adjust, and maintain a cutting torch.
WELD 011B-Discuss the various cutting process

WELD 011B-List advantages and disadvantages of using the various cutting processes.
WELD 011B-Explain the safety considerations of each of the different cutting processes.
WELD 011B-List the advantages of using custom fabrication parts
WELD 011B-Explain how to adjust parts to meet the tolerance.
WELD 011B-Describe how to control weld distortion.
WELD 011B-Describe how to assemble and fit up parts for welding.

Course Content

- Classroom introduction of the following:
  - Welding codes and standards
  - Fabrication techniques
  - Proper grounding
  - Advanced arc welding techniques
  - Stringer beads
  - Weave beads
  - Multi-pass welds
  - Joint preparation
  - Setup of SMAW 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	Demonstrate root passes with or without backing plate, hot passes, filler passes, and cover passes on plate and pipe.
Objective 2	Prepare bend test specimens for plate and pipe.
Objective 3	Explain how a plasma torch works and properly set up and use a plasma torch using proper personal protective equipment appropriate for plasma torch use.
Objective 4	Compare qualification and certification in the welding industry.
Objective 5	Assess the major considerations when selecting a code or standard.
Objective 6	Compile the steps required to certify and/or qualify a weld and a welder.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Demonstrate proper welding techniques using SMAW welding equipment in the overhead position.
Outcome 2	Prepare all sample welds for SMAW certification as defined in the SENSE certification.

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.
Lecture	The instructor uses Google Slides to provide direct instruction at the beginning of the scheduled class.
Self-exploration	Students are expected to read assigned chapters, answer chapter review questions, and be prepared for mid-term and final exams
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 are assessed by instructor.	Out of Class Only
Laboratory projects	Student work samples are self-assessed and assessed by 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
12/02/2019

Course Control Number
CCC000609544

Programs referencing this course

Shielded Metal Arc Welding Certificate (http://catalog.collegeofthedesert.eduundefined?key=232/)
Welding Technology SENSE Entry-Level Welder Certificate of Achievement (http://catalog.collegeofthedesert.eduundefined?key=235/)