

WELD 011B: INTERMEDIATE SHIELDED METAL 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

011B

Full Course Title

Intermediate Shielded Metal Arc Welding

Short Title

INTERM SMAW WELDING

Discipline**Disciplines List**

Welding

Modality

Face-to-Face

Catalog Description

This course covers intermediate level SMAW 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 is the second course in the SMAW Welding series. This course builds on WELD 011A and helps prepare students for the AWS certificate. Prerequisite: WELD 011A

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 011A

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 positions.

Requisite Course Objectives

WELD 011A-Use personal protective equipment purposed for welders and evaluate the types of injuries that can occur and methods to prevent injuries.

WELD 011A-Select the proper welding cable size, proper electrode size, and proper heat settings to make a high-quality weld.

WELD 011A-Demonstrate how to make each of the five basic welds using the SMAW process in both the flat and horizontal positions.

WELD 011A-Using a set of drawings and determine each item shown, its dimensioning, and why a drawing may be scaled, including the major parts of a weld symbol.

Course Content

- Classroom introduction of the following:
 - Pipe welding
 - Fabrication techniques
- Proper grounding
- Fundamentals of arc welding
- 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 to include 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	Explain three general categories of pipe welds, including how they are used and what type of weld root penetration and strength they require and the advantage of welded pipe over fitted pipe.
Objective 2	Assess the preparation needed before welding pipe, explain the purpose of a "Hot pass," and connect the purpose of root, filler, and cove passes for a pipe weld.
Objective 3	Describe the vertical fixed position and the advantages and disadvantages.
Objective 4	Demonstrate how to make a weld in the vertical fixed position and describe the advantages and disadvantages of the vertical fixed position.
Objective 5	Use the proper eye protection and other personal protective equipment that should be used with flame cutting and compare flame-cutting PPE to arc welding PPE.
Objective 6	Demonstrate the oxyfuel gas cutting process and compare fuel gases, metals, regulators, torches, and cutting tips.
Objective 7	Compare various cutting process and analyze the appropriate process for a given metal or type of weldment.
Objective 8	Modify parts to meet tolerance specifications called for in technical drawings, demonstrate how to assemble and fit up parts for welding, and estimate the advantage of custom welding parts.
Objective 9	Demonstrate and compare different methods of controlling heat distortion.

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 vertical position
Outcome 2	Demonstrate fabrication techniques including measuring, bending, cutting, metal preparation, metallurgy and the properties of different metals, and the importance of proper fit-up of weldments based on technical drawings.

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.

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.

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	Out of Class Only
Laboratory projects	Student work samples	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. Laboratory assignments/Welding projects.

Other Out-of-class Assignments

1. a. Reading assignments: Students are required to read four selected chapters from the textbook and to answer chapter review questions for each chapter.
- b. Students are expected to use the materials from their chapter review work to study and prepare for mid-term and final tests.
- c. Students are encouraged to find opportunities outside of class time to practice welding techniques.

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

CCC000609543

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/>)