WELD 170 Course Outline as of Fall 2019

CATALOG INFORMATION

Dept and Nbr: WELD 170 Title: BEGINNING WELDING
Full Title: Beginning Welding: Fundamentals of Arc and Gas Welding
Last Reviewed: 11/13/2023

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	2.00	Lecture Scheduled	1.00	17.5	Lecture Scheduled	17.50
Minimum	2.00	Lab Scheduled	3.00	8	Lab Scheduled	52.50
		Contact DHR	0		Contact DHR	0
		Contact Total	4.00		Contact Total	70.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 35.00 Total Student Learning Hours: 105.00

Title 5 Category:	AA Degree Applicable
Grading:	Grade or P/NP
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	WELD 70

Catalog Description:
This course provides a general overview of the fundamentals of arc and oxy-acetylene welding, and oxy-acetylene flame cutting. Topics will include safety, shop practices and preparation for AWS (American Welding Society) welding certifications.

Prerequisites/Corequisites:

Recommended Preparation:
Eligibility for ENGL 100 or ESL 100

Limits on Enrollment:

Schedule of Classes Information:
Description: This course provides a general overview of the fundamentals of arc and oxy-acetylene welding, and oxy-acetylene flame cutting. Topics will include safety, shop practices and preparation for AWS (American Welding Society) welding certifications. (Grade or P/NP)
Prerequisites/Corequisites:
Recommended: Eligibility for ENGL 100 or ESL 100
Limits on Enrollment:

Transfer Credit:
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**	Effective:	Inactive:
CSU GE:	**Transfer Area**	Effective:	Inactive:
IGETC:	**Transfer Area**	Effective:	Inactive:

CSU Transfer:	Effective:	Inactive:
UC Transfer:	Effective:	Inactive:

CID:

Certificate/Major Applicable:
Certificate Applicable Course

COURSE CONTENT

Student Learning Outcomes:
At the conclusion of this course, the student should be able to:
1. Demonstrate use of tools and equipment in a welding shop per ANSI (American National Standards Institute) safety standards Z49.
2. Perform arc weld from the flat, fillet weld position per American Welding Society (AWS) standards.
3. Perform oxy-acetylene weld on a butt joint, lap joint, fillet joint and brazing fillet joint per AWS standards.
4. Demonstrate ability to safely use oxy-acetylene cutting torch per AWS standards.

Objectives:
Upon completion of this course, students will be able to:
1. Describe and demonstrate principles of welding safety per ANSI and AWS standards.
2. Identify components of oxy-acetylene welding and cutting equipment.
3. Recognize a transformer, rectifier and motor generator type welding machine.
4. Explain electrical terms, including AC and DC welding current.
5. Identify components of shielded metal arc welding equipment.
6. Safely set up and place in operation oxy-acetylene and shielded metal arc welding equipment.
7. Differentiate between plain carbon steel, alloy steel, ferrous metals and non-ferrous metals.
8. Produce a sample butt joint, lap joint, fillet weld and braze welded fillet using the oxy-acetylene welding process.
9. Produce a sample of free hand flame cutting and straight line beveling and piercing.
10. Produce a sample of stringer beads, padding, in the flat position, a multipass fillet weld in the horizontal position, a lap joint and a fillet weld in the vertical down position using shielded metal arc welding.
11. Identify filler metals for oxy-acetylene and arc welding.
12. Recognize uses and purposes of a light, medium and heavy flux coated arc welding electrode. E-6010, E-6011, E-6013, E-7014, E-7018, and E-7024.

Topics and Scope:

I. Shielded Metal Arc Equipment
   A. Arc welding safety per ANSI standard Z49.1
   B. Electrical terms
   C. Welding machines
   D. Personal equipment
   E. Shop equipment
   F. Basic welding terms
II. Oxy-Acetylene Equipment
   A. Oxy-acetylene safety per ANSI standard Z49.1
   B. Oxy-acetylene chemistry
   C. Compressed gas cylinders
   D. Pressure regulators
   E. Hose, torches and tips
   F. Review of safety features and procedures in handling equipment
III. Metallurgy
   A. Steel production
   B. Ferrous and non-ferrous metals
   C. Alloy steels
   D. Effects of heat during welding
   E. Metals identification
IV. Striking an Arc
   A. Arc welding electrode selection
   B. Adjusting equipment
   C. Running short beads
   D. Running continuous beads
   E. Fillet welds
   F. Vertical down beads
   G. Joint design
   H. Manipulative practice
   I. Safety procedures related to striking an arc
V. Oxy-Acetylene Welding
   A. Tip selection and flame settings
   B. Torch position and motion
   C. Selecting a filler rod
   D. Laying beads with a filler rod
   E. Joint design
   F. Butt joint, lap joint and fillet welds
   G. Manipulative practice
   H. Welding safely
VI. Flame Cutting
   A. Cutting safety per ANSI standard Z49.1
   B. Cutting torches
   C. Gas pressure settings
   D. Flame settings
   E. Torch manipulation
   F. Manipulative practice
   G. Safety issues related to flame cutting
VII. Brazing
   A. Joint preparation
   B. Filler rod selection

C. Flame settings
D. Fluxes
E. Temperature control
F. Manipulative practice
G. Safety issues related to brazing

Assignment:

1. Weekly reading assignments, 5 - 25 pages
2. Regular quizzes (7 to 14) based on reading (including handouts developed by AWS, department and from manufacturers)
3. Notes taken during class in student notebook / binder
4. Practical skills assignments and welding samples
5. Writen and practical midterm and final exam which includes questions and testing of AWS licensing requirements and department questions. Passing score per department grading policy
6. Closed book safety tests which includes AWS and department safety issues and procedures. 100% score required to pass

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Notes taken during class	Writing 10 - 10%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

None	Problem solving 0 - 0%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Department approved skill building assignments and welding samples.	Skill Demonstrations 40 - 50%

Exams: All forms of formal testing, other than skill performance exams.

Safety tests, quizzes, writen and practical midterm / final exam	Exams 40 - 50%

Other: Includes any assessment tools that do not logically fit into the above categories.

Participation	Other Category 0 - 10%

Representative Textbooks and Materials:

Guide to the Training of Welding Personnel; Level 1 - Entry Welder. 2nd ed. American Welding Society. 2008 (classic)
Department approved reader.
Instructor prepared materials.