

CATALOG INFORMATION

Dept and Nbr: WELD 70A      Title: BEGINNING WELDING  
Full Title: Beginning Welding- Introduction to Basic Fundamentals  
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 Only  
Repeatability:    22 - 4 Times in any Comb of Levels  
Also Listed As:  
Formerly:

Catalog Description:  
Fundamentals of arc and oxy-acetylene welding and cutting.

Prerequisites/Corequisites:

Recommended Preparation:

Limits on Enrollment:

Schedule of Classes Information:  
Description: Fundamentals of electric arc and gas welding. (Grade Only)  
Prerequisites/Corequisites:  
Recommended:  
Limits on Enrollment:  
Transfer Credit: CSU;  
Repeatability: 4 Times in any Comb of Levels

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

**AS Degree:**      **Area**  
**CSU GE:**        **Transfer Area**

Effective:        Inactive:  
Effective:        Inactive:

**IGETC:**        **Transfer Area**

Effective:        Inactive:

**CSU Transfer:** Transferable      Effective:      Fall 1981      Inactive:      Fall 2019

**UC Transfer:**                      Effective:                      Inactive:

**CID:**

**Certificate/Major Applicable:**

Certificate Applicable Course

## **COURSE CONTENT**

### **Outcomes and Objectives:**

Upon completion of this course, the student will be able to:

1. Describe and demonstrate principles of welding safety.
2. Identify components of oxy-acetylene welding and cutting equipment.
3. Recognize a transformer, rectifier and motor generator type welding machine.
4. Explain the principle of the AC and DC welding current.
5. Identify components of gas metal arc welding equipment.
6. Set up and place in operation oxy-acetylene, arc and gas metal arc welding equipment.
7. Differentiate between plain carbon steel, alloy steel, ferrous 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, weaving 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. Produce a sample lap joint, fillet weld using the gas metal arc process.
12. Identify filler metals for oxy-acetylene and arc welding.
13. Recognize a light medium and heavy flux coated arc welding electrode.
14. Achieve a passing score (75%) on written examinations.
15. Achieve a passing score (75%) on manipulative skill development demonstrations.
16. Based on subsequent repeats, student will develop increased speed, accuracy and refinement of techniques.

### **Topics and Scope:**

- I. Shielded Metal Arc

- A. Arc welding safety
- B. Electrical terms
- C. Welding machines
- D. Personal equipment
- E. Shop equipment
- F. Basic welding terms
- II. Oxy-Acetylene
  - A. Oxy-acetylene safety
  - B. Oxy-acetylene chemistry
  - C. Compressed gas cylinders
  - D. Pressure regulators
  - E. Hose, torches and tips
- III. Metallurgy
  - A. Steel production
  - B. Ferrous and non-ferrous metals
  - C. Alloy steels
  - D. Effects of heat during welding
  - E. Heat treating
  - F. Case hardening
  - G. Metals identification
- IV. Striking and Arc
  - A. Electrode selection
  - B. Adjusting equipment
  - C. Running short beads
  - D. Running continuous beads
  - E. Weaving the electrode
  - F. Fillet welds
  - G. Vertical down beads
  - H. Joint design
  - I. Manipulative practice
- V. Carrying Puddles
  - 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. Manipulative practice
- VI. Flame Cutting
  - A. Cutting safety
  - B. Cutting torches
  - C. Gas pressure settings
  - D. Flame settings
  - E. Torch manipulation
  - F. Manipulative practice
- VII. Brazing
  - A. Joint preparation
  - B. Filler rod selection
  - C. Flame settings
  - D. Fluxes
  - E. Temperature control
  - F. Manipulative practice
- VIII. Gas Metal Arc Welding (MIG)

- A. MIG safety
- B. Power sources
- C. Shielding gases
- D. Wire feeders
- E. Guns and barrels
- F. Consumable wire
- G. Manipulative practice

### Assignment:

1. Weekly reading assignments, 10 - 15 pages.
2. Regular quizzes based on reading (including handouts developed by instructor and from manufacturers).
3. Homework problems, including safety handouts.
4. Practical skills assignments and exams.
5. Midterm; final exam

### 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.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments and skill demonstrations are more appropriate for this course.

Writing  
0 - 0%

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

Homework problems

Problem solving  
5 - 10%

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

Class performances, Performance exams

Skill Demonstrations  
40 - 60%

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

Multiple choice, True/false

Exams  
20 - 40%

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

ATTENDANCE

Other Category  
0 - 10%

### Representative Textbooks and Materials:

Instructor prepared materials.