WELD A143: OCCUPATIONAL WELDING LEVEL 4

Item	Value
Curriculum Committee Approval Date	04/12/2023
Top Code	095650 - Welding Technology
Units	1.5 Total Units
Hours	54 Total Hours (Lecture Hours 18; Lab Hours 36)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	Yes
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)

Course Description

A fourth-level beginning course in arc and oxy-acetylene welding covering safety practices, use of welding, brazing, thermal and mechanical cutting equipment operations on various types of metal. ADVISORY: WELD A142. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Demonstrate proper safety procedures.
2. Weld various SMAW electrodes in the flat, horizontal and vertical position.
3. Weld GTAW in the flat position with mild carbon steel.

Course Objectives

- 1. Demonstrate an understanding of basic welding processes and theory.
- 2. Demonstrate welding skills with SMAW equipment.
- 3. Demonstrate joint design and preparation.
- 4. Correctly identify SMAW welding machines.
- 5. Identify polarity and adjust the welding power source to the correct polarity.
- 6. Weld various SMAW electrodes in the flat, horizontal and vertical position.
- 7. Set up and adjust various types of thermal cutting equipment.
- 8. Cut various metals using thermal cutting equipment.
- 9. Demonstrate an understanding of the GTAW machine.
- 10. Correctly identify GTAW electrode classification.
- 11. Weld GTAW in the flat position.
- 12. Identify special welding process.

Lecture Content

Safety General safety rules Welding equipment safety Personal safety in welding Definition of welding Thermal cutting theory and application Oxy-fuel cutting Carbon arc cutting Plasma arc cutting SMAW equipment and supplies DC and AC machines Cables and electrode holders Remote controls Classification of electrodes DC Arc welding Electrical principles Circuits Polarities Constant current machines Duty cycle Proper electrode selection AC Arc welding Characteristics of alternating current Advantages and disadvantages SMAW theory Starting electrode Arc length geometry Electrode angle Travel speed Stopping the process Weld metal preparation Thermal cutting Machining Grinding Metal joining Welding joints Proper joint preparation GTAW process GTAW equipment Constant current machines Weld torch Collets and collet holders Nozzles Back caps Regulators, gasses, hoses Tungsten electrode classification Remote controls GTAW theory Starting the weld Arc length geometry Torch angle Travel speed Stopping the process Special Welding Processes Submerged arc welding Stud welding Resistance Underwater welding Plasma arc welding Electrode beam and laser welding Friction welding Orbital welding

Lab Content

Safety General safety rules Welding equipment safety Personal safety in welding Definition of welding Thermal cutting theory and application Oxy-fuel cutting Carbon arc cutting Plasma arc cutting SMAW equipment and supplies DC and AC machines Cables and electrode holders Remote co ntrols Classification of electrodes DC Arc welding Electrical principles Circuits Polarities Constant current machines Duty cycle Proper electrode selection AC Arc welding Characteristics of alternating current Advantages and disadvantages SMAW theory Starting electrode Arc length geometry Electrode angle Travel speed Stopping the process Weld metal preparation Thermal cutting Machining Grinding Metal joining Welding joints Proper joint preparation GTAW process GTAW equipment Constant current machines Weld torch Collets and collet holders Nozzles Back caps Regulators, gasses, hoses Tungsten electrode classification Remote controls GTAW theory Starting the weld Arc length geometry Torch angle Travel speed Stopping the process Special Welding Processes Submerged arc welding Stud welding Resistance Underwater welding Plasma arc welding Electrode beam and laser welding Friction welding Orbital welding

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- Lab (04)
- DE Live Online Lab (04S)

Instructional Techniques

Lecture, demonstrations, evaluation , and critique

Reading Assignments

Proficiency demonstrations, written examinations

Writing Assignments

Proficiency demonstrations, written examinations

Out-of-class Assignments

Proficiency demonstrations, written examinations

Demonstration of Critical Thinking

Skill development demonstration and evaluation.

Required Writing, Problem Solving, Skills Demonstration

Written examinations.

Eligible Disciplines

Welding: Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience.

Textbooks Resources

1. Required Galvery, William and Frank Marlow. Welding Essentials: Questions and Answers , 2nd ed. New York: Industrial Press, 2007

Other Resources

1. William Galvery, Orange Coast College Safety Examination