WELD A230: WELDING METALLURGY

Item	Value
Top Code	095650 - Welding Technology
Units	3 Total Units
Hours	72 Total Hours (Lecture Hours 54; Lab Hours 18)
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

Basic metallurgy as applied to welding, metal structures, strength of material. Weld ability of metals, heat treatment, welding procedures, welding stresses and control. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Identify various metals.
2. Perform heat-treatment of metals.
3. Identify the various metallurgical changes caused by welding.
4. Identify and chart stress and strain.

Course Objectives

- 1. Demonstrate methods of identifying metals.
- 2. Demonstrate the ability to identify different metals.
- 3. Demonstrate how metals are affected by heat.
- 4. Demonstrate how metals are affected by stress.
- 5. Demonstrate an understanding of treatments.
- 6. Demonstrate an understanding of alloying.
- 7. Explain the atomic structure of common metals.
- 8. Explain the metallurgical changes with welding process.
- 9. Demonstrate and use modern tools of technology to determine metals qualities.
- 10. Explain stress and strain.
- 11. Explain stress-relieving processes.

Lecture Content

Metallurgy of welding Types of steel and their manufacture Welding methods and processes Temperature changes in welding Structure of metals Mechanical preparation of metals Effects of alloying elements Fluxes and slag Simple welds in steel Shrinkage in welds Preheating and post-heating Difficulties and effects Welding plain carbon and low alloy steels Welding stainless and heat-resisting steels Welding dissimilar metals Welding of aluminum alloys Steel composition, designations, and specifications

Lab Content

See Course Content.

Method(s) of Instruction

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

Instructional Techniques

Comparison of student ability with minimum industry standards

Reading Assignments

Proficiency demonstration of facts and basic principles and vocabulary

Writing Assignments

Proficiency demonstration of facts and basic principles and vocabulary

Out-of-class Assignments

Proficiency demonstration of facts and basic principles and vocabulary

Demonstration of Critical Thinking

Evaluation of tests; laboratory projects; evaluation of written reports; evaluation of the students laboratory and lecture notebook; and a final examination

Required Writing, Problem Solving, Skills Demonstration

Proficiency demonstration of facts and basic principles and vocabulary

Textbooks Resources

1. Required American Welding Society. Introduction to Metallurgy, ed. New York: American Welding Society, 0 Rationale: - 2. Required Galvery, William and Frank Marlow. Welding Essentials: Questions and Answers, 2nd ed. New York: Industrial Press, 2007

Other Resources

1. Selected handout provided by the instructor