

COURSE OUTLINE

Welding 117

I. Catalog Statement

Prerequisite: Eligibility for English 120 or ESL 165.

Note: This course may be taken 4 times; a maximum of 12 units may be earned.

Welding 117 consists of Oxyacetylene welding, flame cutting, (manual and automatic), bronze and silver brazing and soldering. These processes are discussed and demonstrated. The student is given experience in applying the principles by individual practice on a sequence of selected plates and manipulative exercises on various metals.

Units – 3.0

Lecture 3 hours

Given Lectures, demonstration, films, simulations, written and other assignments, students will demonstrate their knowledge by:

1. perform oxy-fuel welding in all positions and oxy-fuel cutting and brazing, plasma arc cutting,
2. demonstrate a knowledge of safety precautions involved in the proper use of oxy-fuel and related equipment,
3. evaluate and critique the finished welding exercises,
4. perform destructive and non-destructive testing on specific weld joints done in all positions,
5. communicate a working knowledge of the use of general shop equipment such as: band saw, drill press, metal cutting shears, radiograph cutter, pedestal and portable grinders, electric wire brush, and various hand tools.

II. Text

“Welding: Principle and Application”, Jeffus & Johnson, 1988, 2nd Edition

“Welding Procedure Handbook”, Kray, 1980

III. Course Outline

- A. Welding Methods
 - 1. Methods classified as forge or fire-resistance arc, metallic arc, shielded gas, fusion
- B. Oxyacetylene
 - 1. Definition and procedure
 - 2. Oxyacetylene flame and types and uses
 - 3. Torch maintenance, regulators
 - 4. Welding rods , types and alloys
 - 5. Common defects, gas inclusion, blow holes
 - 6. Various position, flat, overhead, fillets, tubing
 - 7. A.W.S. safety rules
 - 8. A.W.S. welding rod code
- C. Thermit Welding
 - 1. Definition and uses
 - 2. Reaction of thermit, procedure, allowance for contraction
- D. Unionmelt Welding
 - 1. Definition and uses
 - 2. Application
- E. Welding Sheet Metal
 - 1. Arc welding, gas, resistance
 - 2. Fluxes, bronze welding
- F. Spot Welding
 - 1. Types, procedures
 - 2. Ignition control minimum current
- G. Electric welding
 - 1. Classification, electrodes, tables
 - 2. Current determination, selection of polarity, damp electrodes
 - 3. Position of the weld, types of welding joints
 - 4. Recommended safety rules
 - 5. Preparation of the work, arc blow
- H. Welding aluminum
 - 1. Commercial methods and practices
 - 2. Oxyacetylene, oxy-hydrogen
 - 3. Casting, sheets
- I. Oxyacetylene Cutting
 - 1. Cutting torch, cutting procedure
 - 2. Cutting cast iron, machine cutting
- J. Brazing
 - 1. Definition, codes
 - 2. Process of brazing, heating methods
 - 3. Hard soldering (silver brazing)
 - 4. Induction brazing, definition

- K. Metals
 - 1. Study of metals commonly used in industry
 - 2. Physical properties, tensile, elongation, elastic malleable, hardness
 - 3. Testing of plates on Power equipment
- L. Test plates
 - 1. 20 test plates in various positions

IV. Examination/Evaluation Procedures

Five regularly scheduled one-hour examinations and one two-hour Final Examination (written and objective). Nineteen regularly scheduled practical tests for each area covered in class.

V. Special Features

The class is designed as a related course for the technical fields, Industrial Arts majors, and basic skills for Engineering students.