

JEFFERSON COLLEGE

COURSE SYLLABUS

WLD141

GAS AND BEGINNING ARC WELDING

5 Credit Hours

Prepared by
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Revised by
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WLD141 Gas and Beginning Arc Welding

I. CATALOGUE DESCRIPTION

Prerequisite: None
5 semester hours credit

Gas and Beginning Arc Welding deals with the oxy-acetylene and beginning shielded metal arc welding processes. (F,S)

II. GENERAL COURSE OBJECTIVES

Upon completion of the course, the student should be able to:

- A. Seek a vocation as welding specialists and to prepare for employment as welding technicians.
- B. Create positive work attitudes and safety consciousness.
- C. Initiate a desire to continually improve skills and knowledge.
- D. Cultivate an acute interest in welding technology.
- E. State the potential for welding technicians.

III. OUTLINE OF TOPICS

- A. Introduction to Welding Technology
 - 1. Introduction: The Goals and Functions of Welding Technology
 - a. Examine American Welding Society classifications of welding technology
 - b. Examine career opportunities in welding technology
 - c. Safety in the welding shop
 - d. Demonstrate and explain safety techniques of oxy-acetylene welding
 - e. Demonstrate set up of oxy-acetylene equipment
 - f. Commence oxy-acetylene exercises
 - g. Practice puddling in the FI flat position
 - 2. Equipment - Safety in Welding
 - a. Cylinders construction
 - b. Regulations in handling cylinders
 - c. Demonstrations in use of filler rods
 - d. Practices in surface beads
 - e. Coverage of torches and tips
 - f. Coverage of regulations
 - g. Individual critique
 - 3. Cutting and Gouging
 - a. Use of cutting torches
 - b. Use of cutting tips
 - c. Hand cuts
 - d. Tip selection
 - e. Pressures of regulations
 - f. Demonstrations of plate cutting
 - g. Methods of cuts
 - h. Metal distortion

4. Oxy Fuel - Equipment Setup and Operation
 - a. Pressure regulators
 - b. Weld/Heat tips
 - c. Reverse flow and flashback arrestors
 - d. Hoses and fittings
 - e. Backfire/flashback
 - f. Types of flames
 - g. Leak detection
 - h. Manifold systems
 5. Oxy Fuel Gases and Filler Metals
 - a. Various fuel gases
 - b. Flame rate of burning
 - c. Acetylene
 - d. Liquefied fuel gases
 - e. Methyl/Ace Propadiene (MAPP)
 - f. Pro/natural gas
 - g. Hydrogen
 - h. Filler metals
 - i. Mild steel
 6. Oxyacetylene Welding - Flat Position
 - a. Mild steel welds
 - b. Outside corner joints
 - c. Butt joints
 - d. Lap joints
 - e. T-joints
 7. Oxyacetylene Welding - Various Positions
 - a. Stringer beads
 - b. Mild steel and tube
 - c. Horizontal rolled position 1G
 - d. Horizontal fixed position 5G
 8. Brazing and Braze Welding - Part I
 - a. Advantages of soldering and brazing
 - b. Physical properties of a joint
 - c. Fluxes
 9. Brazing and Braze Welding - Part II
 - a. Soldering and brazing methods
 - b. Filler metals
- B. Introduction to Current Welding - SMAW
1. Shielded Metal Arc Equipment, Setup, and Operation
 - a. Welding current
 - b. Types of welding power
 - c. OCV
 - d. Operating voltage

2. Shielded Metal Arc Welding
 - a. Arc blow
 - b. Types of power source
 - c. Generators/alternators
 - d. Rectifiers
3. SMAW
 - a. Duty cycles
 - b. Welding cables
 - c. Electrode Holders
 - d. Work clamps
 - e. Set ups
4. SMAW of Plate - Part I
 - a. High/low current settings
 - b. Electrode size and heat
 - c. Arc length
 - d. Electrode angle
5. SMAW of Plate - Part II
 - a. Electrode manipulation
 - b. Position (welder plate)
 - c. Practice welds
6. SMAW of Plate - Part III
 - a. Stringer beads
 - b. Square butt joint
 - c. Lap joints
 - d. T-joints
7. Filler Metal Selection
 - a. SMAW information
 - b. Core wire
 - c. Flux covering - function
 - d. Filler selection
 - e. AWS filler metal classification
8. Testing and Inspection of Welds
 - a. Quality control
 - b. Discontinuities and defects
 - c. Destructive tests
 - d. Root bends
 - e. Face bends
 - f. Tensile pulls

IV. UNIT OBJECTIVES

The student should be able to:

- A. Describe welding as a joining process
- B. Name examples of items that have used some type of welding during their manufacturing.
- C. Describe in general terms the Shielded Metal Arc Welding (SMAW) process.

V. METHOD(S) OF INSTRUCTION

10% Lecture
90% Lab Performance

VI. REQUIRED TEXTBOOK(S)

Welding - Principles and Applications, Larry Jeffus

VII. REQUIRED MATERIALS

Safety Glasses
#1 Victor welding tip 1-W-1
Tip Cleaners
Chipping Hammer
Wire Brush
Cutting Goggles with #5 lens
Welding Hood with #10 lens
Soap Stone
Combination Square
Vise Grip
Flint Type Striker
Welding Gloves
Welding Jacket
Padlock for Locker
Boots or Shoe Protector

VIII. SUPPLEMENTAL REFERENCES

None

IX. METHOD OF EVALUATION

A. Distribution of the Final Grade

30% - Welding Manipulative Skills - Practical Welding Tests
30% - Examination of Welding Theory - Semester Tests and Chapter Reviews
20% - Instructor Evaluation - Attitude and Attendance,
emphasis being placed on positive work attitudes, initiative,
and cooperation
20% - Final Examination

B. Attendance Policy

Attendance for this class is mandatory. According to the Attendance Policy listed in the Jefferson College Catalog, If a student misses more than 15 percent of the total time (including lecture and laboratory) that the class meets in a term, the student may be removed from the class.

For this class, four (4) tardies constitute one absence.

C. Assignment of Final Letter Grade

A - 90 to 100

B - 80 to 89

C - 70 to 79

D - 60 to 69

F - Below 59

IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Technology Center 101; phone 636-481-3169).

X. ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see College website <http://www.jeffco.edu>).

XI. ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

XII. OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.

