



WELD 101 - WELDING THEORY & PRACTICE 2 Course Outline

Approval Date: 08/11/2009

Effective Date: 08/10/2009

SECTION A

Unique ID Number CCC000188813

Discipline(s)

Division Career Education and Workforce Development

Subject Area Welding

Subject Code WELD

Course Number 101

Course Title WELDING THEORY & PRACTICE 2

TOP Code/SAM Code 0956.50 - Welding Technology/Welder* / D - Possible Occupational

Rationale for adding this course to the curriculum WELD 101 is the second of a two part series designed to provide an appreciation of welding skills while teaching some of the fundamentals of welding processes for community members and non-majors.,WELD 101 is the second of a two part series designed to provide an appreciation of welding skills while teaching some of the fundamentals of welding processes for community members and non-majors.

Units 3

Cross List N/A

Typical Course Weeks

Total Instructional Hours

Contact Hours

Lecture 36.00

Lab 54.00

Activity 0.00

Work Experience 0.00

Outside of Class Hours 72.00

Total Contact Hours 90

Total Student Hours 162

Open Entry/Open Exit No

Maximum Enrollment

Grading Option Letter Grade or P/NP

**Distance
Education Mode
of Instruction**

SECTION B

General Education Information:

SECTION C

Course Description

Repeatability May be repeated 0 times

Catalog Description The second of a two-semester welding course designed to fit the needs of students in other vocational areas and upgrade welders already in the industry. This welding course is designed to develop and upgrade manipulative skills, technical knowledge and an appreciation of welding.

**Schedule
Description**

SECTION D

Condition on Enrollment

1a. Prerequisite(s)

- WELD 120 or
- WELD 130 or
- WELD 100

1b. Corequisite(s): *None*

1c. Recommended

- WELD 100

1d. Limitation on Enrollment: *None*

SECTION E

Course Outline Information

1. Student Learning Outcomes:

- Identify and recognize hazards associated with a welding environment utilizing Oxy-Fuel, SMAW, GMAW, GTAW, PAC, and CAC-A
- Apply the use of Personal Protective Equipment (PPE)
- Apply common terminology related to safety
- Explain basic theory of operation of OFC, PAC, SMAW and GMAW equipment
- Set up SMAW and GMAW equipment for welding mild steel with E6010, E7018 and hardwire electrodes
- Recognize and explain visual defects in electric arc welding
- Perform SMAW and GMAW welding in 1G and 2G positions.

2. Course Objectives: Upon completion of this course, the student will be able to:

- Demonstrate and practice good safety and personal work habits. Use the tools, machines and equipment of welding in a professional manner
- Exhibit knowledge of the nomenclature of electrodes, gases and other supplies of welding
- Demonstrate knowledge of procedures, processes and techniques of welding
- Perform basic skills in arc welding and oxygen-fuel gas cutting
- Exhibit basic knowledge of welding materials, symbols and layout
- F.

3. Course Content

- A. Orientation
 - a. The Classroom, shop area and its machines and tools
 - b. General shop rules
 - c. Personal conduct – attitudes and responsibilities
 - d. Testing and grading
- B. Safety
 - a. Personal safety and habits
 - b. Shop safety rules
 - c. Oxyacetylene safety
 - d. Arc welding safety
 - e. Safety devices – fire extinguishers, fire blankets, etc.
 - f. General safety – grinders, hand tools, electrical, etc.
 - g. Safety test
- C. Oxygen Fuel Gas Cutting
 - a. Safety
 - b. Manual oxygen-fuel gas
 - c. Cutting torches (types)
 - d. Oxygen-fuel gas flames, temperatures of each, etc.
 - e. Machine oxygen-fuel gas cutting
 - f. Cutting nozzles, tips, and gas pressures
- D. Electrical Arc Welding with Stick Electrodes
 - a. Safety
 - b. Machines and equipment
 - c. Polarity – straight and reverse
 - d. Nomenclature of electrodes and coatings
 - e. Preparations of metals for welding
 - f. Starting and setting machines – voltage and amperage
 - g. Striking and maintaining the arc
 - h. Running the basic welds
 - i. Flat, horizontal, vertical and overhead welding with various electrodes
 - j. Terminology, processes, procedures and techniques
- E. Materials
 - a. Ferrous materials
 - b. Non-ferrous materials.
 - c. Properties of metals
 - d. Carbon steels; alloy steels
- F. Preparing and Finishing Materials
 - a. Safety
 - b. Layout and fitting
 - c. Cleaning Materials
 - d. Handling materials
 - e. Edge preparations for welding
 - f. Clean-up and painting
 - g.

4. Methods of Instruction:

Lab:

Lecture:

Other (Specify):

Other: Lectures with white board and computer presentations Visual laboratory demonstrations of welding techniques Hands-on laboratory activities

5. Methods of Evaluation: Describe the general types of evaluations for this course and provide at least two, specific examples.

Typical classroom assessment techniques

- Exams/Tests --
- Final Exam --
- Mid Term --

Additional assessment information:

Students will be given written weekly tests covering assigned reading and weekly lectures. (example: tests comprised of multiple choice and T/F questions)

Students will complete weekly lab assignments. (example: place a bevel groove weld with a backing bar using E7018 electrode in the vertical position)

Students will be given a mid-term and final examination. (example: tests comprised of multiple choice, identification, short answer and T/F questions)

Letter Grade or P/NP

6. Assignments: State the general types of assignments for this course under the following categories and provide at least two specific examples for each section.

A. Reading Assignments

1. Students will be required to read selections from their textbook in order to understand essential concepts (example: section on Gas Metal Arc Welding (GMAW), Learn To Weld, textbook)
2. Students will be required to read selections from their textbook and lecture notes in order to perform lab exercises. (example: produce a fillet weld on a T joint with an ER70S-6 electrode in the vertical position)

B. Writing Assignments

1. Students will be required to write-up lab assignments. (example: List three reasons that GMAW is used)
2. Students will be required to formulate corrective actions while welding. (example: correctly adjusting machine settings to achieve the proper voltage/amperage relationship)
3. Students will interpret welds to formulate corrective action. (example: determine possible changes in setting parameters and/or technique to avoid undercut)

C. Other Assignments

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7. Required Materials

A. EXAMPLES of typical college-level textbooks (for degree-applicable courses) or other print materials.

Book #1:

Author: Bridgum
Title: How To Weld
Publisher: Motorbooks
Date of Publication: 2008
Edition: 1st

B. Other required materials/supplies.

- Safety glasses and gauntlet style welding gloves.