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Welding (WELD) 1040 Shielded Metal Arc Welding (SMAW) (3 Units)

Prerequisite: Successful completion in Welding 1500, Industrial Education Welding 0001, 1001, or 1002 with a grade of “C” or better

Prerequisite knowledge and skills:

Before entering the course, the student should be able to:

1. understand the principles of safe work habits as related to oxy-fuel welding and cutting and the various electric arc welding processes,
2. set up oxy-fuel welding and cutting equipment,
3. braze and solder ferrous and non-ferrous alloys, and
4. apply understanding of the common welding processes [Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), Flux-Cored Arc Welding (FCAW) and Gas Tungsten Arc Welding (GTAW)] while utilizing proper safety and technique.

Total Hours: 32 hours lecture; 64 hours lab (96 hours total)

Course Description: This course will cover the theory and application of the Shielded Metal Arc Welding (SMAW) process. Emphasis will be on safe and proper application of the SMAW process while welding in a variety of positions with common welding electrodes. This course has a material fee.

Type of Class/Course: Degree Credit

Text: Moniz, B. J., and R. T. Miller. *Welding Skills*. 4th ed. Orland Park, Illinois: American Technical Publishers, 2009. Print.

Additional Instructional Materials: None

Course Objectives:

By the end of the course, a successful student will be able to:

1. understand and practice safe work habits related to Shielded Metal Arc Welding (SMAW),
2. demonstrate the setup, operation and theory related to Shielded Metal Arc Welding (SMAW),

3. use the Shielded Metal Arc Welding (SMAW) process,
4. develop skill and knowledge required to successfully weld mild steel in a variety of positions with common welding electrodes, and
5. understand the various welding codes and test requirements often associated with the Shielded Metal Arc Welding (SMAW) process.

Course Scope and Content:

- Unit I Introduction and Safety Procedures
 - A. Overview
 - B. Safety Related to Shielded Metal Arc Welding (SMAW)

- Unit II Shielded Metal Arc Welding (SMAW)
 - A. Equipment
 - B. Setup and Operation

- Unit III Shielded Metal Arc Welding (SMAW) Process
 - A. Proper Application

- Unit IV Weld Joint
 - A. Design
 - B. Nomenclature

- Unit V Shielded Metal Arc Welding (SMAW)
 - A. Plate Overview

- Unit VI Selection and Process
 - A. Welding Metallurgy
 - B. Weldability of Metals

- Unit VII Weld Metals
 - A. Shapes
 - B. Sizes

- Unit VIII Welding Standards
 - A. Codes
 - B. Standards and Costs

- Unit IX Weld Quality
 - A. Testing
 - B. Inspection of Welds

- Unit X Welder Code Testing
 - A. Certification
 - B. Qualification

- Unit XI Welding Careers and Future Training

- A. Future Training Opportunities
- B. Possible Career Options and Types

Learning Activities Required Outside of Class:

The students in this class will spend a minimum of 6 hours per week outside regular class time doing the following

1. Assigned readings from the text
2. Completing the necessary assignments
3. Preparing for industry code testing

Methods of Instruction:

1. Lectures
2. Presentations
3. Laboratory practice
4. Class discussions

Methods of Evaluation:

1. Computational or non-computational problem-solving demonstrations, including:
 - a. exams
 - b. quizzes
2. Skill demonstrations, including:
 - a. practical skill demonstration performance
3. Other examinations, including:
 - a. multiple choice
 - b. true/false items