

Prepared by: M. Dommer
Date prepared: May 18, 2009
Reviewed by: K. Bandy
Reviewed by: M. Wade
Reviewed by: S. Aunai
Revised by: W. Sullivan
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Welding (WELD) 1020 Gas Tungsten Arc Welding (GTAW) (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 Core 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 Gas Tungsten Arc Welding (GTAW) process. Emphasis will be on safe and proper application of these processes while welding on mild steel, aluminum and stainless steel. This course has a material fee.

Type of Class/Course: Degree Credit

Text: Miller, R.T., and B. J. Moniz. *Welding Skills*. 4th ed. Orland Park, IL: 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 Gas Tungsten Arc Welding (GTAW) process,
2. demonstrate the setup, operation and theory related to the Gas Tungsten Arc Welding (GTAW) process,
3. use the proper welding process,
4. demonstrate skill and knowledge required to successfully weld, and
5. understand the various welding codes and tests often associated with the Gas Tungsten Arc Welding (GTAW) process.

Course Scope and Content:

- Unit I Introduction Gas Tungsten Arc Welding (GTAW)
 - A. Overview
 - B. Purpose and General Application

- Unit II Welding Safety
 - A. General Safety
 - B. Gas Tungsten Arc Welding (GTAW) and Related Safety

- Unit III Gas Tungsten Arc Welding (GTAW)
 - A. Equipment
 - B. Setup and Operation
 - C. Common Welding Processes

- Unit IV Selection and Processes
 - A. Filler Metal Selection
 - B. Weldability of Metals
 - C. Welding Metallurgy

- Unit V Welding Codes and Standards
 - A. Overview
 - B. Codes and Standards

- Unit VI Testing
 - A. Testing of Welds
 - B. Inspection of Welds

- Unit VII Metal Weight Chart
 - A. Steel Shapes
 - B. Steel Sizes

- Unit VIII Plasma Arc Cutting (PAC)
 - A. Overview and Purpose
 - B. Cutting and Demonstration

- Unit IX 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