

Course Code: WLD 112

Course Title: Gas Metal Arc Welding

Department: Applied Sciences and Technologies

Effective Date: Summer 2026

PCS Code: 1.2 - Occupational/Technical Instruction

CIP Code: 48.0508

Repeatability: 0

Credit Hours

Catalog Notation: 1-2-2

Credit Hour Distribution:

Lecture: 1

Lab: 2

Clinical: 0

Total: 2

General Course Information

Catalog Description

Gas metal and arc welding fundamentals, welding safety, gas metal arc equipment adjustments, metal transfer, and shielding gases; skill development in all positions of welding on mild steel ranging from 1/8" to 22 gauge steel.

General Course Objectives

Students will be able to safely set up, adjust, and use GMAW machinery, and develop manipulative skills in all positions of GMAW for mild and high-carbon steels.

Minimum Placement Levels

English	Reading	Math
Placement into ENG 098	Placement into CCS 098	Placement into MAT 059

Prerequisites

Credit or concurrent enrollment in WLD 110 or WLD 111

Methods of Evaluation

Minimum evaluation methods include: 2-4 weekly lab assignments to evaluate skill proficiency (70% of total points); 2 written exams and 1 quiz to evaluate knowledge acquired in classroom setting (30% of total points).

Instructional Materials and Additional Supplies

GMAW/FCAW Handbook, by Minnick/Mosman.

Course Content

General Learning Outcomes (GLOs)

- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Overview of the Course, the Course Outline, and Introduction to Gas Metal Arc Welding	1. State the objectives of the course. 2. List the methods of evaluation. 3. List the grade scale to be used for the course.	1	0	0
GMAW Skills	1. Complete padding on 1/8" steel. 2. Complete groove and fillet welds on 1/8" steel in the 1G, 2F, 3F, and 4F positions. 3. Complete fillet welds on 12-14 gauge steel in the 2F and 3F positions. 4. Complete fillet welds on 16-18 gauge steel in the 2F and 3F positions. 5. Complete fillet welds on 18-20 gauge steel in the 2F and 3F positions. 6. Complete fillet welds on 20-22 gauge steel in the 2F and 3F positions. 7. Complete horizontal fillet and groove welds on 20 and 22 gauge steel. 8. Produce plug welds on 22 gauge material.	1	25	0
Gas Metal Arc Welding Safety	1. Demonstrate proper safety procedures at all times. 2. Score a minimum of 100% on safety exams. 3. List the hazards created by inert gas welding. 4. Demonstrate the safety practices of inert gas welding. 5. List the personal welding equipment required to protect the welder.	2	1	0
Gas Metal Arc Theory Practice and Equipment Setup	1. Summarize and explain the theory of GMAW welding. 2. List the advantages of GMAW welding over conventional stick-arc welding. 3. Prepare GMAW welding equipment for use. 4. Name and explain the main components of a GMAW welding outfit. 5. List the factors which affect the setup of GMAW welding equipment.	2	0	0
Types of Shielding Gases Relevant to Types of Metal Being Welded	1. Explain the function of a shielding gas in the GMAW welding process. 2. List the types of shielding gases used, the characteristics of each type of gas, and the type of metal and welding conditions each shielding gas is used with. 3. List the parts and functions that comprise the GMAW work station. 4. Describe the process of the gas delivery system of the GMAW work station. 5. Determine correct gas flow rates upon particular welding applications.	2	0	0
Types of GMAW Welding Used in Industrial and Production Situations	1. List the three methods of metal transfer in the GMAW welding process. 2. Describe each method relevant to the welding current, quantity of molten metal transfer, quality of penetration, spatter, arc stability, and applications of each type of transfer to metal size and type. 3. List the conditions and factors on which each type of metal transfer depends. 4. Simulate each type of metal transfer setup on the GMAW welding equipment.	1	0	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Types of Fill Wire Available for GMAW Welding	1. Explain the American Welding Society (AWS) classification code for GMAW welding wire. 2. Identify the basic wire diameters that are available for GMAW welding. 3. List the factors to consider when selecting the electrode wire. 4. Explain the process and applications of flux core welding.	2	0	0
Out-of-Position Welding	1. Describe the types of arc transfer to be used in out-of-position welding. 2. List the major problems encountered in out-of-position welding. 3. Explain the techniques used in GMAW in each of the positions. 4. Name a weld in each of the four off positions.	2	2	0
Troubleshooting Set-Up and Operational Problems on the Metal Inert Gas (MIG) Equipment, Along with a Focus on the Fillet Weld Symbol	1. List the probable areas of GMAW welding problems. 2. List common GMAW welding problems, their causes, and possible ways to correct them. 3. Demonstrate efficient cleaning methods. 4. List the negative results of spatter buildup. 5. Identify the primary elements of a fillet weld symbol, including its location, size, and length.	2	2	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
15	30	0