

JAMESTOWN COMMUNITY COLLEGE

State University of New York

INSTITUTIONAL COURSE SYLLABUS

Course Title: Adv Gas Metal Arc Welding

Course Abbreviation and Number: WLD 2260

Credit Hours: 3

Course Type: Lecture/Lab

Course Description: Advanced gas metal arc welding practices and power source technology, including programmable and pulsing constant voltage machines, will be used. Machine set-up and techniques for nonferrous metals, including aluminum and stainless steel, will be practiced. Advanced arc welding techniques will be performed in the flat, horizontal, vertical, and overhead positions on structural plate. Identifying and analyzing defects in welding joints is emphasized. Carbon steel plate is welded using Gas Metal Arc Welding (GMAW) to American Welding Society (AWS) Code. Students will develop skills necessary to make quality welds on carbon steel pipe with open root and with backing rings according to AWS, American Society of Mechanical Engineers (ASME), and American Petroleum Institute (API) code.

Prerequisite: WLD 1360; **Eligibility:** MAT 1590.

Student Learning Outcomes:

Students who demonstrate understanding can:

1. Identify the effects of GMAW welding variables on weld quality.
2. Produce acceptable GMAW single-pass fillet welds in the 1F, 2F, 3F (vertical up and vertical down), and 4F positions.
3. Produce acceptable GMAW multiple-pass groove welds on carbon steel plate and pipe.
4. Identify the applications and equipment requirements for aluminum GMAW, stainless steel GMAW, Flux Cored Arc Welding (FCAW), and AWS D1.1 weld qualification.

Topics Covered

- 1.) Advanced Gas Metal Arc Welding (GMAW) Techniques
 - GMAW welding variables
 - Multiple-pass welding techniques
 - Root pass
 - Hot pass
 - Filler passes
 - Cover pass
 - Weld restarts
 - Interpass cleaning
 - Weld quality
- 2.) Carbon Steel GMAW
 - Single-pass fillet welds
 - 1F – Flat
 - 2F – Horizontal
 - 3F – Vertical Up
 - 3F – Vertical Down
 - 4F – Overhead
 - Multiple-pass groove welds
 - 1G – Flat (AWS D1.1 Qualification)
- 3.) Pipe Welding
 - Guided bend test preparation
 - AWS D1.1 visual inspection and bend test acceptance criteria
 - Pipe preparation and fit-up
 - Open-root pipe welding
 - Multiple-pass pipe welding
 - Welding positions
 - 1G – Rolled
 - 2G – Fixed Vertical
 - 5G – Fixed Horizontal
 - 6G – Fixed 45° Inclined
- 4.) Advanced GMAW Applications
 - Spray transfer
 - Pulsed spray transfer
 - Pulse-on-pulse transfer
 - Stainless steel GMAW
 - Flux Cored Arc Welding (FCAW)
 - Fabrication project from an engineering drawing

Information for Students

- Expectations of Students
 - [Civility Statement](#)
 - [Student Responsibility Statement](#)
 - [Academic Integrity Statement](#)
- Accessibility Services: <https://www.sunyjc.edu/accessibility>

- Get Help: <https://www.sunyjcc.edu/gethelp>
- Emergency closings: <https://www.sunyjcc.edu/jccalert>
- Course grades are determined by the instructor based on a combination of factors, including but not limited to, homework, quizzes, exams, projects, and participation. Final course grade can be translated into a grade point value according to the following:

Letter Grade	A	B+	B	C+	C	D+	D	F
Numerical Grade	4.0	3.5	3	2.5	2	1.5	1	0

- Veterans and active-duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, VA appointments) are welcome and encouraged to communicate these to the instructor.

Effective Date: Fal 2026