

**WELD - 1104 Intro Shielded Metal Arc Weldg, 4.00 Credits**

Level: Lower

Applied Learning-Practicum

This course provides the student with an introduction to shielded metal arc welding, welding safety and power sources. Through hands-on technical training, the student will develop the skills necessary to make quality fillet welds on mild steel using the shielded metal arc welding process in all positions and on varying plate thickness.

**WELD - 1204 SMAW I, Carbon Arc Cutting & Gouging, 4.00 Credits**

Level: Lower

Applied Learning-Practicum

This course provides the student with a thorough technical understanding of shielded metal arc welding (SMAW), carbon arc cutting, welding and cutting safety, power sources, and electrodes. Through hands-on technical training, the student will develop skills necessary to make quality groove welds on mild steel, in all positions and on varying plate thickness. Carbon arc skills will include cutting and gouging of mild steel.

**WELD - 1723 Welders Calculations I, 3.00 Credits**

Level: Lower

Basic mathematical functions used by the welder in the performance of their duties will be the subject of this course. Mathematical operations such as manipulation of fractions, decimals and unilaterally converting between the two and into the metric measurement system along with calculating perimeter, volumes, weight and bend calculations will be taught in this course. This mathematics course will be trade related and will focus on the math needed by the welder to perform their required tasks. All of the math topics taught in this course are trade related. This course is designed to meet the daily needs of welders. This course is not intended for a general math audience.

**WELD - 1724 Gas Welding/Cutting & Plasma Cutting, 4.00 Credits**

Level: Lower

Applied Learning-Practicum, Course Fee \$112.00

This course is designed to teach the student the fundamental skills of oxy-fuel and plasma processes used in industry. Major topics include principles of operation, component identification, equipment set up, minor repairs, process variables, and manual and automatic performance exercises. Laboratory exercises emphasize technique and skill development.

**WELD - 1728 Arc Welding, Carbon Arc Cutting, 8.00 Credits**

Level: Lower

Applied Learning-Practicum

This course provides the student with a thorough technical understanding of shielded metal arc welding, carbon arc cutting, welding and cutting safety, power sources, and electrodes. Hands-on technical training will develop skills necessary to make quality arc welds on mild steel, in all positions and on varying plate thickness. Carbon arc skills will include cutting, gouging, and weld washing of mild steel.

**WELD - 1733 Welding, Blueprint Reading, Inspection, 3.00 Credits**

Level: Lower

This course provides the student with a thorough technical understanding of blueprint reading for welders, and welding trades, symbol interpretation and application. The welding symbol and its meaning will be stressed throughout the course. Students will also learn methods of inspection, and practical application and interpretation of welding code.

**WELD - 2715 Shielded Metal Arc & Flux Cored Arc Welding, 5.00 Credits**

Level: Lower

Applied Learning-Practicum, Course Fee \$112.00

This course is designed to provide instruction on those welding processes used in industry that are in high demand including flux cored arc welding and shielded metal arc welding. All processes, positions, and joint types studied will be in accordance with American Welding Society specifications. Students will be active in the American Welding Society.

**WELD - 2725 Gas Metal Arc Welding, 5.00 Credits**

Level: Lower

Applied Learning-Practicum

This course is designed to provide instruction on those welding processes used in industry that are in high demand including flux cored arc welding and shielded metal arc welding. All processes, positions, and joint types studied will be in accordance with American Welding Society specifications. Students will be active in the American Welding Society.

**WELD - 2733 Tolerancing & Working Drawings, 3.00 Credits**

Level: Lower

This course is designed for the welding student to understand the typical working drawing and any tolerances that may apply. These tolerances include unilateral, bilateral and geometric tolerances. The importance of accuracy and proper orientation of weldments will be stressed. This application will address all possible tolerancing and drawing applications the student will need to be effective as an industrial welder.

**WELD - 2735 Gas Tungsten Arc Welding I, 5.00 Credits**

Level: Lower

Applied Learning-Practicum

This course provides the student with a thorough technical understanding of gas tungsten arc welding, welding safety, arc characteristics and welder certification. Hands-on technical training will develop skills necessary to make quality gas tungsten arc welds on mild steel, stainless steel, and aluminum using both direct and alternating current. Certification documentation for the student will be performed for all welding processes with special attention placed on code conformance and welding procedure development.

**WELD - 3005 SMAW II, Codes/ Inspection Basic CNC, 5.00 Credits**

Level: Lower

Applied Learning-Practicum, Course Fee \$112.00

This course covers safety standards, CNC machine set-up and operation, programming, theory, practice and performance of Shielded Metal Arc Welding (SMAW II). Students will learn and apply OSHA standards and correct CNC machine operation. CNC programming and SMAW II theory will also be covered. Students will be performing a variety of fillet and groove welds. All position qualification testing will prepare students for welder certification testing.

**WELD - 3015 GMAW II, FCAW II, 5.00 Credits**

Level: Lower

Applied Learning-Practicum

This course will cover the practice and proper use of protective clothing, equipment, and hand tools for the safe use of constant voltage welding equipment. Students will learn to work with different shielding gas mixtures, make adjustments and repairs to equipment according to manufacturer's recommendations. Proper set up, operation and theory will qualify the student for certification in gas metal arc welding of steel, stainless and aluminum in the short arc, spray and globular modes of metal transfer. Qualification testing will also be performed in outer shield and inner shield flux cored arc welding.

**WELD - 3025 GTAW II Comp of Materials, 5.00 Credits**

Level: Lower

Applied Learning-Practicum

Students will learn setup and operating procedures, gas cylinder handling, flow meter and torch operations for welding aluminum, carbon and stainless steel pipe, tube and plate. The course will also cover the various methods of testing and inspection of welds. All position qualification testing will prepare students for welder certification testing.

**WELD - 3813 Metallurgy, Code, Cert, Insp & Test, 3.00 Credits**

Level: Lower

This course will cover the principles related to the welding metallurgy, the properties of metals, and the residual stress and distortion caused by the welding process. Locate the essential information for codes and standards pertaining to the industry and work assignments for the materials used. Students will be able to perform inspections of cut surfaces of prepared metals (pre-welding) and inspect, as well as test welds during and post welding.

**WELD - 4013 Senior Project, 3.00 Credits**

Level: Lower

Applied Learning-Creative Work

This course is designed as a capstone project to verify a student's ability in all aspects of welding. The student will be required to identify a need for a new product or improvement on an existing product. After identification, the completion of the project will occur with minimal instructor guidance. This will allow the student to demonstrate their ability to perform independently. Upon completion, the student will demonstrate the functionality of their project in the form of a formal presentation. This will be a functional model of the student's own design.

**WELD - 4425 GMAW III, FCAW III, SAW, 5.00 Credits**

Level: Lower

Applied Learning-Practicum, Course Fee \$112.00

This course will involve the safety inspections of the MIG welding equipment and its accessories. Student will be capable of making minor repairs to this equipment and accessories. This will also include the changing of wire electrodes and cable liners. Students will learn the troubleshooting of welding equipment problems, how to recognize them, and the correct procedures in the use of the equipment. As before, setup and safe operation would be taught for both short circuit welding and for the pulsed spray transfer methods of welding. Students will perform welds on both carbon steel pipe and aluminum pipe. Using flux cored electrode, the student will be instructed in the use of self-shielding and gas shielding methods of filler transfer. Students will learn each method of welding as well as combinations of each.

**WELD - 4435 SMAW III, GTAW III, 5.00 Credits**

Level: Lower

Applied Learning-Practicum

This course involves the safety inspections of welding equipment and accessories. Student will be able to make external repairs to the equipment and accessories. Setup the components and accessories for a complete shielded metal arc welding system. Setup and operate the SMAW equipment for alloy pipe. Execute corrective actions to repair surface flaws on welds and base metals. Perform an unlimited thickness performance qualification test on carbon steel pipe. Perform a limited thickness performance qualification test on carbon steel and 300 series stainless steel pipe using stainless steel electrodes. Refinement will be made to student capabilities in SMAW, GTAW, and GMAW using various materials. Pipe welding using a variety of processes will be stressed. All instruction shall lead toward student certification for Level II AWS certification.

**WELD - 4445 Welding Fabrication, 5.00 Credits**

Level: Lower

Applied Learning-Practicum

This course will be conducted as though the student were employed in an actual work environment. The student will perform all necessary work in the fabrication of various parts. Safe and proper set up and use of appropriate equipment for various applications will be expected. Along with the setup and use of equipment, the student will be required to generate and apply weld process sheets and inspect each weld using industrially accepted inspection processes. The student will be observed in performing various duties common in industry today, as well as applications of any certifications, codes, and standards that must be met for qualifications. The student must also interpret destructive and non-destructive test results, as well as perform bend, penetrant and magnetic particle testing. They will perform visual examination and complete inspection records and reports.

**WELD - 4900 Directed Study, 1.00 TO 5.00 Credits**

Level: Lower

A student may contract for one to five credit hours of independent study through an arrangement with an instructor who agrees to direct such a study. The student will submit a plan acceptable to the instructor and to the department chairperson. The instructor and student will confer regularly regarding the process of the study.