

WELDING (WELD)

WELD-105 Welding Theory

2 Credits

Lecture: 2 hours per week

Offering: Fall Only, All Years

This course consists of basic metallurgy, identification of metals and electrodes, theory of welding processes, identify proper usage of testing methods, welding gases, joint design and configuration, welding positions, welding currents and polarity. Welding qualifications and procedures will also be covered.

WELD-106 Welding Theory II

2 Credits

Lecture: 2 hours per week

Offering: Spring Only, All Years

This course is a continuation of theories learned in WELD-105. This course continues to build on the knowledge of basic metallurgy, identification of metals and electrodes, theory of welding processes, identifying proper usage of testing methods, welding gases, joint design and configuration, welding positions, welding currents, and polarity. Welding qualifications and procedures will also be covered.

WELD-112 Safety and Leadership

2 Credits

Lecture: 2 hours per week

Offering: Fall Only, All Years

This course will introduce the student to lab organization and safety procedures. The student will demonstrate applied leadership skills and abilities, demonstrate and identify hand tools and their proper usage. The student will also demonstrate and identify power tools and equipment including their proper usage and maintenance.

WELD-121 Blueprint Reading for Welders

2 Credits

Lecture: 2 hours per week

Offering: Fall Only, All Years

This course will cover basic lines, views, dimensioning and structural shapes, abbreviation and weld symbols, working with structural and piping drawings, and bill of materials.

WELD-131 Advanced Blueprint Reading

3 Credits

Lecture: 3 hours per week

Offering: Spring Only, All Years

This course covers interpreting drawings and develop material lists, sketch or draw components for layout, and calculate material costs from blueprints. Specific applications for steel, pipe, or other welding projects will be directed to meet student and community needs. AWS adopted standards for welding symbols will be the primary reference for blueprint interpretation.

WELD-140 Autobody and Paint Technology Welding

2 Credits

Lecture: 1 hour per week, **Lab:** 2 hours per week

Offering: Fall Only, All Years

This course is part of the Autobody and Paint Technology program. It prepares repair technicians to perform basic welding processes and techniques required by industry. Students will gain skills in several welding processes including oxy-acetylene cutting and welding, plasma arc cutting of steel and aluminum, gas tungsten arc welding, and gas metal welding. Students will learn proper safety in operating welding and cutting equipment. Students may obtain the I-CAR Welder Certificate.

WELD-182L Welding Lab II

6 Credits

Lab: 18 hours per week

Offering: Spring Only, All Years

This course will focus on gaining competency in FCAW and GMAW application on ferrous steel plate in the flat, horizontal, vertical, up, and overhead welding position. Students will weld on steel plate and other common materials using the proper welding techniques on butt, lap, tee, and corner joints in all four welding positions. AWS standards will apply for welds on butt, tee, lap, and corner joints. AWS D1.1 structural bend test standards will also apply.

Prerequisites: WELD-105, WELD-112, WELD-121, WELD-187L, WELD-188L, WELD-197L

Corequisites: WELD-106, WELD-131

WELD-187L SMAW Practical

4 Credits

Lab: 12 hours per week

Offering: Fall Only, All Years

This course covers SMAW welding principles and will include fillet and groove welds in all positions to the AWS standards. Successfully completing this course may lead to certification.

WELD-188L Advanced SMAW Practical

1 Credit

Lab: 2 hours per week

Offering: Fall Only, All Years

This course will cover advanced SMAW concepts and procedures. Students will become proficient in advanced welding techniques of open-root welding on plate with and without backer. AWS certification testing conditions will prevail on completion of this course.

Corequisites: WELD-105, WELD-112, WELD-121, WELD-187L, WELD-197L

WELD-197L Oxy/Fuel Cutting Lab

1 Credit

Lab: 2 hours per week

Offering: Fall Only, All Years

This course includes instruction in the techniques of cutting using manual, machine processes and equipment with the oxy/fuel process. Students will practice using manual and machine methods on ferrous metal assignments.

WELD-225 Advanced Welding Theory

3 Credits

Lecture: 2 hours per week, **Lab:** 3 hours per week

Offering: Fall Only, All Years

This course will emphasize American Society of Mechanical Engineers (ASME) and American Welding Society (AWS) welding test procedures in Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), Flux-cored Arc Welding (FCAW), and Gas Tungsten Arc Welding (GTAW). Students will also be exposed to Plasma Cam operations.

Prerequisites: WELD-106, WELD-131, WELD-182L

Corequisites: WELD-226;, WELD-281L

WELD-226 Layout/Mechanical Drawing

2 Credits

Lecture: 1 hour per week, **Lab:** 3 hours per week

Offering: Fall Only, All Years

This course will introduce students to the concepts and techniques of mechanical drawing. It will cover basic line drawings, use of mechanical drawing equipment, isometric and orthographic projections, and geometric drawings. Students will prepare geometrical drawings and draw layouts. This course will also enable students to perform layout of structural steel using fabricating practices. Students will be able to determine elevations of structures and how to construct using calculating equipment including transits, scientific calculators, and various squaring and leveling tools. The student will also be able to calculate the layout of pipe including figuring offsets, runs, and travel distances.

Prerequisites: WELD-106, WELD-131, WELD-182L

Corequisites: WELD-225, WELD-281L

WELD-227 Advanced Welding Theory II

3 Credits

Lecture: 2 hours per week, **Lab:** 3 hours per week

Offering: Spring Only, All Years

This course is a continuation of WELD 225 and includes further discussion on the problems associated with heating and cooling metals and the properties of a variety of metals used in the welding process. Students will gain a working knowledge of fabrication techniques and manufacturing processes of the metals used in welding. Characteristics of the traditional welding and bonding agents used in welding will be provided to give students a background on metal identification, metallurgical behaviors, and the determination of weldability of ferrous and nonferrous metals. This course will also teach students basic GTAW methods and theory on thin gauge mild steel, stainless steel, and aluminum in all positions using both direct and alternating current. Equipment setup and adjustment will be emphasized to match with welding applications.

Prerequisites: WELD-225, WELD-226, WELD-281L

Corequisites: WELD-228, WELD-291L

WELD-228 Advanced Mechanical Drawing

3 Credits

Lecture: 2 hours per week, **Lab:** 3 hours per week

Offering: Spring Only, All Years

This course covers detail drawings related to the welding industry. Proper dimensioning and tolerances, use of sectioning techniques, isometrics and oblique drawings, including pip welding symbols and bill of materials will be covered as well.

Prerequisites: WELD-225, WELD-226, WELD-281L

Corequisites: WELD-227, WELD-291L

WELD-281L Shielded Metal Arc Welding

7 Credits

Lab: 14 hours per week

Offering: Fall Only, All Years

This course covers the advanced applications of SMAW and will include small diameter thin wall pipe and tubing in all positions. Additional instruction will cover high-pressure pipe welding using #6010 on root pass, #7018 fill, and over passes. Qualification in various pipe fitter levels may be offered.

WELD-291L Gas Tungsten Arc Welding Lab

6 Credits

Lab: 12 hours per week

Offering: Spring Only, All Years

This course covers the advanced applications of GTAW and will include small diameter wall pipe and tubing in all positions. Additional instruction will cover high-pressure pipe welding using GTAW on root pass, E7018 fill, and cover passes. AWS certification in various pipe-fitting levels may be offered.