Course Information Form (CIF)

Course Code: WLD 111

Course Title: Introduction to Welding

Department: Applied Sciences and Technologies
PCS Code: 1.2 - Occupational/Technical Instruction
CIP Code: 48.0508
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 2-4-4
Credit Hour Distribution:

Lecture: 2	Lab: 4	Clinical: 0	**Total: 4**

General Course Information

Catalog Description

Introductory theory and practice in oxyacetylene and shielded metal arc welding. Includes oxyacetylene fusion welding in various positions on plate steel, shielded metal arc welding in all positions on plate steel with two different electrodes with emphasis on skill development, manual oxy-fuel cutting, plasma arc cutting with a brief introduction to gas metal arc welding and gas tungsten arc welding.

General Course Objectives

To develop in students: safe working habits and the ability to select, maintain, and use arc, oxyacetylene, and inert gas welders; a working knowledge of and an appreciation for welding and its effect on industry; a foundation of basic knowledge which may be used both vocationally and avocationally; and the self-confidence to systematically evaluate situations to make sound decisions based on this evaluation.

Minimum Placement Levels

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

Prerequisites

None

Methods of Evaluation

Students will be graded on a minimum of 24 welding proficiencies and 2 safety quizzes (70% of grade), with 2 major exams and 1 final exam (30% of grade).

Instructional Materials and Additional Supplies

Welding: Principles and Practices, by Bohnart
Welding gloves and safety glasses.

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
Course Overview, Course Outline, and Introduction to Welding	1. List the objectives of the course. 2. Describe how class work will be evaluated. 3. List the grade scale to be used for the course.	2	0	0
Welding Safety	1. Observe proper safety procedures at all times while using oxyacetylene and electric arc equipment. 2. Score 100% on safety exams. 3. Identify the equipment and materials essential for safe welding. 4. Describe the safe handling and storage of oxyacetylene welding equipment and bottles. 5. Explain the safety precautions for electric arc welding. 6. Describe the proper clothing to be worn in the welding shop.	5	2	0
Oxyacetylene Theory, Practice, and Equipment Setup	1. Explain how fusion is achieved using the oxyacetylene welding process. 2. Explain the steps in setting up an oxyacetylene welding unit. 3. List the five factors which affect the selection of the proper welding tip. 4. Describe the procedure for lighting the oxyacetylene welding torch, adjusting the torch to the proper flame, and shutting down the torch.	2	4	0
Arc Welding Theory, Practice, and Equipment	1. Explain how fusion is achieved in electric arc welding. 2. Explain five items which affect the quality of a weld. 3. Explain how molten metal is transferred from the electrode to the plate. 4. List the safety precautions to be taken in electric arc welding.	2	4	0
Welding Rod and Electrode Arc Selection	1. Identify the five basic welding rods used with the oxyacetylene torch. 2. Explain the American Welding Society (AWS) code for oxyacetylene welding rods. 3. Explain the four parts to the AWS electrode identification code. 4. Cite examples of the uses for E-6010, E-6011, and E-7018 electrodes.	2	4	0
Off-position Welding	1. Explain each of the four off-positions in welding. 2. List the major problems which may be encountered in off-position welding. 3. Explain how to counter the effects of the above-mentioned problems on the weld. 4. Explain the techniques used in both oxyacetylene and arc welding in each of the off positions.	2	6	0
Brazing, Braze Welding, and Soldering	1. Differentiate between the heat requirements for fusion welding, brazing, and soldering. 2. Describe the procedure used in brazing and soldering a joint in mild (carbon) steel. 3. Describe the characteristics of a brazed or soldered head. 4. Describe the procedure for high temperature (silver) soldering.	1	15	0
Oxyacetylene and Arc Cutting	1. List the steps for cutting with the oxyacetylene cutting torch and the arc welder. 2. List the safety precautions to be used in oxyacetylene and electric arc cutting. 3. List the gas pressures used to cut 0.25 inch thick metal. 4. Describe the procedure used in the cutting of a hole in a piece of steel plate with the oxyacetylene and arc cutting processes.	1	1	0

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Characteristics and Welding of Cast Iron	1. Identify three types of cast iron. 2. Describe the procedure for preparing the metal for oxyacetylene fusion welding and brazing of cast iron. 3. Describe the correct electrode and procedure for electric arc welding of cast iron.	2	1	0
Using the Carbon Arc Torch	1. Describe the principles of the operation of the carbon arc torch. 2. Identify common uses of the carbon arc torch. 3. Compare and contrast the uses of the carbon arc torch and oxyacetylene torch. 4. List the hazards and safety precautions associated with the carbon arc torch.	1	1	0
Gas Shielded Welding	1. List the advantages and disadvantages of gas shielded welding. 2. Describe the gases used in welding. 3. Describe the three current types used in inert gas welding and the advantages and disadvantages of each.	1	16	0
Gas Tungsten Arc Welding (GTAW)/Tungsten Inert Gas Welding (TIG)	1. Describe the parts of the GTAW equipment. 2. Explain how GTAW welding is done.	1	1	0
Gas Metal Arc Welding (GMAW)/Wire Welding	1. Describe the part of the GMAW equipment. 2. Explain how GMAW welding is accomplished. 3. Compare and contrast the Shielded Metal Arc Welding (SMAW), GMAW, and GTAW welding processes.	1	1	0
Heat Treating Metals	1. Define heat treating metals.	1	0	0
Inspecting and Testing Welds	1. Identify common weld problems. 2. Suggest possible causes and solutions to the problems. 3. Describe the D1.1 structural steel code bend test. 4. Describe the bend tests and the tensile strength test, and list the failures these tests may cause.	2	2	0
Metal Surfacing	1. Describe the processes of metal surfacing, and list the advantages of these procedures. 2. List and define the types of wear metal surfaces may be subjected to. 3. Give examples of the ferrous, non-ferrous, and hard-surfacing materials. 4. Compare and contrast the different types of hard-facing.	1	0	0
Equipment Maintenance	1. Identify the procedures involved in testing and maintaining oxyacetylene and electric arc welding equipment.	2	2	0
Pipe Welding	1. List the various materials used to make pipe. 2. List the materials used to line pipe. 3. Describe the procedure used in pipe qualification tests. 4. List the advantages of welded pipe joints. 5. List the procedure for preparing and welding pipe.	1	0	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
30	60	0