

## Welding

### **Description**

This program provides instruction in various welding processes and techniques including oxyfuel cutting, carbon arc cutting, shielded metal arc welding, gas tungsten arc welding (TIG welding), flux-cored arc welding, gas metal arc welding (MIG welding), pipe welding, plasma arc cutting, oil and gas welding, blueprint reading, welding symbols, and joints.

### **Program Learning Objectives**

1. Learn and demonstrate safe welding practices while completing welding tasks.
2. Learn and demonstrate various metal cutting techniques using metal saws, grinders, and oxygen-acetylene fueled torches.
3. Learn and demonstrate the capacity of reading and understanding the symbols and notations used in the development of blueprints for welding projects.
4. Learn and demonstrate the development of the arc and puddle control while employing SMAW welding techniques.
5. Learn and demonstrate the SMAW technique of creating overlapping beads to form a bed of solid metal.
6. Learn and demonstrate various welding techniques using SMAW process in Fillet, V-Groove, BU, Gouge, and several pipe and flat iron positions.
7. Learn and demonstrate various welding techniques using GTAW process in Basic Multi-Joint positions using steel and aluminum wire.
8. Learn and demonstrate various welding techniques using GMAW process in Fillet and Groove welds.
9. Learn and demonstrate various welding techniques using FCAW process in Fillet and Groove welds.
10. Learn and demonstrate several metal working techniques to complete a project as assigned by the instructor.

**Curriculum**

<b>Course #</b>	<b>Course Title</b>	<b>Lecture/ Lab Hours</b>	<b>Credit Hours</b>	<b>Clock Hours</b>
LEAD 1003	Work Readiness	2/2	3	90
WKSF 1003	Industrial Workplace Safety	2/2	3	90
WELD 1023	SMAW Basic Bead	2/2	3	90
WELD 1411	SMAW Fillet Weld	2/2	3	90
WELD 1421	SMAW V-Groove Open/BU/GOUGE	2/3	4	120
<b>CTS 1 - Welder Helper - Level I</b>			<b>16</b>	<b>480</b>
WELD 1510	SMAW Pipe 2G	2/3	4	120
WELD 1511	SMAW Pipe 5G	2/3	4	120
WELD 1512	SMAW Pipe 6G	2/3	4	120
WELD 2093	GMAW Basic Fillet Weld /Groove Welds	2/2	3	90
<b>CTS 2 - Welder Helper - Level II</b>			<b>31</b>	<b>930</b>
WELD 2100	FCAW Basic Fillet Weld /Groove Welds	2/2	3	90
WELD 1074	GTAW Basic Multi-Joint	2/4	4	150
WELD 2231	GTAW Aluminum Multi-Joint or Special Project	2/3	4	120
WELD 2123	Capstone: Advanced Welding Problem Solving	2/2	3	90
<b>TD - Welding Technology</b>			<b>45</b>	<b>1380</b>

**Course Descriptions**

***LEAD 1003 Work Readiness***

This course is designed to prepare for job readiness by reviewing the skills necessary for employment, including time management, communication, teamwork, and professionalism. The student will engage in a variety of skill-building activities, create a resume, participate in a simulated interview process, and review basic math and English skills necessary for their chosen program of study.

***WELD 1023 SMAW Basic Bead***

Introduction to the principles of Shielded Metal Arc Welding (SMAW). Component and consumable identification including the safe setup of equipment and practice of welding stinger beads, weave beads, and overlapping beads in various positions using various electrodes.

***WELD 1074 GTAW Basic Multi-Joint***

An introduction to the principles of Gas Tungsten Arc Welding (GTAW), component and consumable identification including the safe setup of equipment and practice of welding beads (fillet welds), and groove welds in the flat, vertical, horizontal, and overhead positions using carbon steel consumables.

***WELD 1411 SMAW Fillet Weld***

Safely setup and operate Shielded Metal Arc Welding (SMAW) equipment with practice of single and multi-pass fillet welds in the flat, horizontal, vertical, and overhead positions using various electrodes.

***WELD 1421 SMAW V-Groove Open/BU/GOUGE***

Safely setup and operate Shielded Metal Arc Welding (SMAW) equipment with practice of V-Groove welds with a backing or back gouging in the flat, horizontal, vertical, and overhead positions using various electrodes.

***WELD 1510 SMAW Pipe 2G***

An introduction to the safe setup of equipment and principles of Shielded Metal Arc Welding of Pipe (SMAW-Pipe) in the 2G vertical fixed position, joint preparation, proper weld quality, qualification testing, and practice welding Shielded Metal Arc Welding of Pipe (SMAW-Pipe) in the 2G vertical fixed position.

***WELD 1511 SMAW Pipe 5G***

Safely setup equipment and apply principles of Shielded Metal Arc Welding of Pipe (SMAW Pipe) in the 5G horizontal fixed position, review joint preparation, review proper weld quality and qualification testing, and practice welding Shielded Metal Arc Welding of Pipe (SMAW-Pipe) in the 5G horizontal fixed position.

***WELD 1512 SMAW Pipe 6G***

Safely setup equipment and apply principles of Shielded Metal Arc Welding of Pipe (SMAW Pipe) in the 6G - 45 fixed position, review joint preparation, review proper weld quality and qualification testing, and practice welding Shielded Metal Arc Welding of Pipe (SMAW Pipe) in the 6G - 45 fixed position.

***WELD 2093 GMAW Basic Fillet/Groove Welds***

An introduction to the principles of Gas Metal Arc Welding (GMAW) types of weld transfer, weld quality, and component and consumable identification including the safe setup of equipment and practice of welding fillet/ groove welds in flat, horizontal, vertical, and overhead positions.

***WELD 2100 FCAW Basic Fillet Weld/Groove***

An introduction to the principles of Flux Core Arc Welding (FCAW), component and consumable identification including the safe setup of equipment and practice of fillet/groove welds in the flat, vertical, horizontal, and overhead positions.

***WELD 2123 Capstone: Adv. Problem Solving***

This course prepares the student for upcoming welding tests, troubleshooting problems from previous courses, and special projects.

***WELD 2231 GTAW Aluminum Multi-Joint***

An introduction to the principles of Gas Tungsten Arc Welding (GTAW), aluminum, component and consumable identification including the safe setup of equipment and practice of welding beads (fillet welds) in the flat, vertical, horizontal, and overhead positions using aluminum consumables.

***WKSF 1003 Industrial Workplace Safety***

This course will provide an overview of the construction industry by examining organizational structures and systems, safety regulations and agencies, construction documents, office and field organizations, and the various construction crafts and trades. This course will focus on the basic knowledge and skills needed in the construction industry by studying safety, math, hand tools, power tools, rigging, blueprint reading, communication, and employability.