



Appendix A
ON-THE-JOB LEARNING OUTLINE
AWS CERTIFIED WELDER
O*NET-SOC CODE: 51-4121.00 RAPIDS CODE: 0622

Description: Welds metal components together to fabricate or repair products, such as machine parts, structures, plant equipment, according to layouts, blueprints, or work orders, using brazing and variety of arc and gas welding equipment. May be required to pass employer performance tests or standard tests to meet certification standards of governmental agencies or professional and technical associations.

The work process schedule is intended as a guide. It is not to be followed in any particular sequence, and it is understood that some adjustments may be necessary in the apprentice’s assignments allotted for different work experience. Overall, an apprentice shall receive sufficient experience to make him/her able to demonstrate a high level of expertise in the work processes which are part of this occupation. In addition, the apprentice shall be fully instructed in safety and OSHA requirements as may be applicable to maintain a safe and healthy work environment.

Work Process Schedule:

Approximate Hours

• Weld components in flat, horizontal, vertical, and overhead positions.	1500
• Recognize, set up, and operate hand and power tools common to the welding trade.	500
• Proper set up of welding equipment for common welding processes such as shielded metal arc, gas metal arc, gas tungsten arc, submerged arc, and flux cored arc welding.	500
• Proper set up of cutting, gouging, and thermal heating equipment.	200
• Weld separately or in combination, using carbon steel, stainless steel, and other alloys.	200
• Select and install torches, torch tips, filler rods, and flux, according to welding chart specifications or types and thicknesses of metals.	200
• Ignite torches or start power supplies and strike arcs by touching electrodes to metals being welded, completing electrical circuits	100
• Guide and direct flames or electrodes on or across workpieces to straighten, bend, melt, or build up metal	50
• Operate safety equipment and use safe work habits	200
• Familiar with ANSI Z49.1 standard safety practices and hazards	25
• Examine workpieces for defects and measure workpieces with straightedges or templates to ensure conformance with specifications	100
• Check grooves, angles, or gap allowances, using micrometers, calipers, and precision measuring instruments	50



<ul style="list-style-type: none">Examine finished welds with common visual inspection gauges	50
<ul style="list-style-type: none">Select and install torches, torch tips, filler rods, and flux, according to welding procedure specifications or material types and thicknesses of metals	100
<ul style="list-style-type: none">Determine required equipment and welding methods, applying knowledge of metallurgy, geometry, and welding techniques	80
<ul style="list-style-type: none">Connect and turn regulator valves to activate and adjust gas flow and pressure so that desired flames are obtained	50
<ul style="list-style-type: none">Connect and turn regulator valves to activate and adjust gas flow meets desired specification for welding operations requiring external gas source.	50
<ul style="list-style-type: none">Ignite torches or start power supplies and strike arcs by touching electrodes to metals being welded, completing electrical circuits	100
<ul style="list-style-type: none">Correctly apply and monitor pre-heat and post-heat treatment to materials and weld joint areas	25
<ul style="list-style-type: none">Mark or tag material with proper job number, piece marks, and other identifying marks as required	50
<ul style="list-style-type: none">Determine and identify material types from indication markings	50
<ul style="list-style-type: none">Monitor the fitting, burning, and welding processes to avoid overheating of parts or warping, shrinking, distortion, or expansion of material	100
<ul style="list-style-type: none">Identify and resolve welding defects and discontinuities present from flawed equipment or practices.	150
<ul style="list-style-type: none">Chip or grind off excess weld, slag, or spatter, using hand scrapers or power chippers, portable grinders, or arc-cutting equipment	200
<ul style="list-style-type: none">Clean or degrease parts, using wire brushes, portable grinders, pneumatic scalers, or chemical applications	50
<ul style="list-style-type: none">Grind, cut, buff, or bend edges of workpieces to be joined to ensure snug fit, using power grinders and hand tools	50
<ul style="list-style-type: none">Prepare all material surfaces to be welded, ensuring that there is no loose or thick scale, slag, rust, moisture, grease, or other foreign matter	100
<ul style="list-style-type: none">Ensure weld joint preparation meets details outlined in welding procedure specification	50
<ul style="list-style-type: none">Chip or grind off excess weld, slag, or spatter, using hand scrapers or power chippers, portable grinders, or arc-cutting equipment	100



<ul style="list-style-type: none">• Implement arc, plasma, or flame gouging practices when needed	50
<ul style="list-style-type: none">• Preheat workpieces prior to welding or bending, using torches or heating furnaces.	50
<ul style="list-style-type: none">• Apply post heat when detailed and required	50
<ul style="list-style-type: none">• Align and clamp workpieces together, using rules, squares, or hand tools, or fixtures, jigs, or vises	100
<ul style="list-style-type: none">• Correctly position and place parts into fixtures	50
<ul style="list-style-type: none">• Proficient in tack welding and weld sequence	50
<ul style="list-style-type: none">• Develop templates and models for welding projects, using mathematical calculations based on blueprint information	50
<ul style="list-style-type: none">• Nest, layout, and utilize materials efficiently	50
<ul style="list-style-type: none">• Position and secure workpieces, using hoists, cranes, wire, and banding machines or hand tools	100
<ul style="list-style-type: none">• Select, identify, and proper use of fasteners or anchors	20
<ul style="list-style-type: none">• Detect faulty operation of equipment or defective materials and notify supervisors	50
<ul style="list-style-type: none">• Competent with Lock out Tag out procedures	50
<ul style="list-style-type: none">• Detect faulty operation of equipment or defective materials and notify supervisors	50
<ul style="list-style-type: none">• Clean or degrease parts, using wire brushes, portable grinders, or chemical baths	50
<ul style="list-style-type: none">• Monitor and replace consumables and wear components as needed such as contact tubes, wire liners, and work clamps.	100
<ul style="list-style-type: none">• Use fire suppression methods in industrial emergencies	50
<ul style="list-style-type: none">• Grind, cut, buff, or bend edges of workpieces to be joined to ensure snug fit, using power grinders and hand tools	100
<ul style="list-style-type: none">• Repair products by dismantling, straightening, reshaping, and reassembling parts, using cutting torches, straightening presses, and hand tools	100
<ul style="list-style-type: none">• Grind, cut, buff, or bend edges of workpieces to be joined to ensure snug fit, using power grinders and hand tools	50
<ul style="list-style-type: none">• Repair products by dismantling, straightening, reshaping, and reassembling parts, using cutting torches, straightening presses, and hand tools	100



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• Operate metal shaping, straightening, and bending machines, such as brakes and shears	100
• Set up and use ladders and scaffolding as necessary to complete work	100
• Use fixtures, jigs, dogs, as necessary for proper material and weld joint fitment	50
• Hammer out bulges or bends in metal workpieces	100
• Analyze engineering drawings, blueprints, welding procedure specifications, sketches, work orders, and material safety data sheets to plan layout, assembly, and operations	200
• Understand welding symbols in accordance with AWS A2.4	100
TOTAL HOURS:	7000