

**COURSE FAB2050: ARC WELDING 1****Level:** Intermediate**Theme:** Fabrication Processes**Prerequisite:** FAB1050 Basic Electric Welding**Description:** Students develop basic knowledge, skills and attitudes related to the operation and use of shielded metal arc welding (SMAW) equipment and accessories to make a variety of welds in the flat position.**Parameters:** Access to a fabrication work centre complete with shielded metal arc welding equipment and supplies and to instruction from an individual with formal, specialized training in arc welding practices.**Curriculum and Assessment Standards**

General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>identify the appropriate treatment for minor injuries associated with welding processes</li> <li>describe the visual characteristics of a desirable weld</li> <li>demonstrate basic SMAW competencies in the flat position</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>the proper identification of first-aid treatment for minor cuts, burns and bruises</li> <li>identification and description of the important visual characteristics of a desirable weld</li> <li>the completion of a series of stringer and/or weave beads in the flat position on a given weldment and two successive fillet and butt weld joints in the flat position.</li> </ul> <p><i>Assessment Tool</i>  <i>Fabrication Process: Basic Arc Welding, FAB2050-1</i>  <i>Illustrative Example: Flat Lap Joint Fillet Weld, FAB2050-2</i></p> <p><i>Standard</i>  <i>Weld profile should be slightly convex and of uniform width and height; ripples are to be close, bullet shaped and free of voids, slag inclusion, high spots and apparent restarts. Good plate penetration should exist over the entire length of the weld</i>  <i>Performance rating of 2 for each applicable task</i></p>	<p>15</p> <p>10</p> <p>75</p>

**COURSE FAB2050: ARC WELDING 1 (continued)**

General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Outcomes	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>First Aid</li> <li>Electrical Fundamentals</li> <li>Arc Welding Equipment</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>demonstrate and describe the procedures for administering first aid for minor cuts, burns and bruises</li> <li>explain the effects of arc flash and the suggested treatment</li> <li>describe the effects of inadequate ventilation and the suggested treatment</li> <li>demonstrate knowledge of the following electrical terms:               <ul style="list-style-type: none"> <li>direct current</li> <li>alternating current</li> <li>voltage</li> <li>amperage</li> <li>resistance</li> <li>polarity</li> <li>open circuit voltage and arc voltage</li> </ul> </li> <li>compare the operation and current output produced by a:               <ul style="list-style-type: none"> <li>transformer</li> <li>rectifier</li> <li>generator</li> </ul> </li> <li>explain the meaning of duty cycle</li> </ul>	<p>Students need to have a good understanding of electrical terms and principles for their own safety and appreciation of how arc welding equipment operates.</p> <p>Explain the difference between a constant current power supply used in SMAW and a constant voltage supply used on GMAW equipment.</p>

**COURSE FAB2050: ARC WELDING 1 (continued)**

Concept	Specific Outcomes	Notes
<ul style="list-style-type: none"> <li>• Welding Accessories</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• describe the construction and sizing of cables</li> <li>• compare the different types of electrode holders and maintenance requirements</li> <li>• identify the types and uses of cable lugs, quick connectors and work clamps.</li> </ul>	
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Technique</li> </ul> <p>Equipment Set-up</p> <ul style="list-style-type: none"> <li>• Weld Quality</li> </ul>	<ul style="list-style-type: none"> <li>• describe and demonstrate the accepted methods of striking an arc</li> <li>• describe the difference between a stringer bead and a weave bead</li> <li>• describe and demonstrate the proper tacking procedures and weld profile for a flat fillet weld</li> <li>• adjust the equipment to coincide with the type of electrode, type of weld and metal thickness</li> <li>• identify the attributes of a quality weld.</li> </ul>	<p>Students should have experience using different electrodes and diameters:</p> <ul style="list-style-type: none"> <li>• E6011 (41011)</li> <li>• E6010 (41010)</li> <li>• E7018 (48018)</li> <li>• E7024 (48024).</li> </ul>
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Shielded Metal Arc Welding</li> </ul>	<ul style="list-style-type: none"> <li>• lay a consistent and even stringer bead and/or weave bead in the flat position</li> <li>• run a series of stringer beads in the flat position to create a layer of weld metal</li> <li>• make lap and square butt welds on mild steel plate in the flat position.</li> </ul>	

**COURSE FAB2050: ARC WELDING 1 (continued)**

Concept	Specific Outcomes	Notes
<p>Assessment</p> <ul style="list-style-type: none"><li>• Quality Control</li><li>• Career Preparation</li></ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"><li>• inspect a weld by considering the overall appearance, size and shape of the beads; plate penetration, fusion, undercutting and overlapping</li><li>• prepare a record of completed activities within a portfolio.</li></ul>	