

**COURSE FAB3060: ARC WELDING 4****Level:** Advanced**Theme:** Fabrication Processes**Prerequisite:** FAB3050 Arc Welding 3**Description:** Students apply and extend positional welding skills, by using a variety of common electrodes and thickness of materials.**Parameters:** Access to a welding facility complete with shielded metal arc welding equipment and supplies and to instruction from an individual with welding trade qualifications.**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>explain the effects heating and cooling have on a weld and weldment</li> <li>demonstrate advanced level sheet metal arc welding (SMAW) competencies in the flat, horizontal and vertical positions</li> <li>describe a career related to the welding field</li> </ul> | <p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>the description of the effects heating and cooling have on the quality of a weld and the adjacent materials</li> <li>completion of a variety of welds to first period trade standards using different electrodes and thicknesses of materials.</li> </ul> <p><i>Assessment Tool</i><br/> <i>Fabrication Process, Butt Joint Welds,</i><br/> <i>FAB3060-1</i><br/> <i>Illustrative Example: Flat Vee-groove Butt Joint,</i><br/> <i>FAB3060-2</i></p> <p><i>Standard</i><br/> <i>Performance rating of 3 for each applicable task</i></p> | <p>10</p> <p>70</p> |
|  | <ul style="list-style-type: none"> <li>presentation of one occupational profile that outlines: <ul style="list-style-type: none"> <li>description of the occupation/trade working conditions</li> <li>employment opportunities</li> <li>training requirements.</li> </ul> </li> </ul> <p><i>Assessment Tool</i><br/> <i>Assessment Framework: Presentations/Reports,</i><br/> <i>CTSPRE</i></p> <p><i>Standard</i><br/> <i>Performance rating of 3 for each applicable task</i></p>   | <p>20</p>           |

**COURSE FAB3060: ARC WELDING 4** (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><br/> <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>Heating and Cooling</li> <li>Electrode Selection</li> </ul> | <p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>describe the effect of single and multiple pass welds on the base metal and previously deposited filler metal</li> <li>explain the effect cold working conditions might have on weld quality</li> <li>explain the need to preheat or postheat</li> <li>describe the factors to be considered when choosing an electrode; e.g.:               <ul style="list-style-type: none"> <li>static and dynamic loading</li> <li>weld position</li> <li>materials to be welded</li> <li>current supply</li> <li>ease of use</li> <li>joint design and alignment</li> <li>rate of deposit</li> <li>depth of penetration</li> <li>weld finish.</li> </ul> </li> </ul> |       |

**COURSE FAB3060: ARC WELDING 4** (continued)

| Concept  | Specific Outcomes  | Notes   |
|--|--|---|
| <p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Preparation</li> <li>• Equipment Set-up</li> </ul> | <p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• describe the properties and uses of the following electrodes:                             <ul style="list-style-type: none"> <li>– E6010 and 11</li> <li>– E7014, 18 and 24</li> </ul> </li> <li>• select the appropriate electrode for a given application</li> <li>• prepare the surfaces for welding</li> <li>• correctly position the weld</li> <li>• adjust the equipment to coincide with the type of electrode, weld and metal thickness.</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>• demonstrate first period arc welding skills in the flat, horizontal and vertical positions using a variety of weld types, joints, electrodes and thickness of mild steel</li> <li>• prepare welds for testing.</li> </ul>   | <p>Welds completed here should be similar to those found in the first period of the apprenticeship program.</p> |
| <p>Assessment</p> <ul style="list-style-type: none"> <li>• Quality Control</li> <li>• Career Preparation</li> </ul>        | <ul style="list-style-type: none"> <li>• perform a non-destructive and destructive test where appropriate</li> <li>• describe employment opportunities and further training requirements for the welding trade or related occupation</li> <li>• evaluate personal interests and abilities related to making realistic career choices</li> <li>• prepare a record of completed activities within a portfolio.</li> </ul>  | <p>At this level, most faults can be detected through visual inspection.</p>                                    |

