

**COURSE FAB1110: BAR & TUBULAR FABRICATION****Level:** Introductory**Theme:** Fabrication Processes**Prerequisite:** FAB1010 Fabrication Tools & Materials**Description:** Students use cutting, bending and fastening processes to create a variety of products from bar and tubular stock.**Parameters:** Access to a materials work centre complete with basic hand tools and metal forming equipment.**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>list and describe common shapes and sizes of bar and tubular stock</li> <li>demonstrate approved material handling and storage practices</li> <li>apply basic bar and tubular fabrication skills and techniques to produce a product</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>the presentation of a written report that lists and graphically describes common bar, angle, tube and pipe sizes and shapes.</li> </ul> <p><i>Assessment Tool</i> <i>Presentations/Reports: Bar and Tubular Stock, FAB1110-1</i></p> <p><i>Standard</i> <i>Performance rating of 1 for each applicable task</i></p>	10
	<ul style="list-style-type: none"> <li>observed performance related to: <ul style="list-style-type: none"> <li>use of personal protective equipment</li> <li>correct lifting techniques</li> <li>proper storage of materials and cut-offs</li> </ul> </li> </ul>	20
	<ul style="list-style-type: none"> <li>successful completion of a bar and/or tubular product that uses one or more common metal bar or tubular forms.</li> </ul> <p><i>Assessment Tool</i> <i>Product Assessment: Working with Bar Stock, FAB1110-2</i></p> <p><i>Standard</i> <i>The product should be structurally sound, have tight-fitting joints and meet the stated size, shape and finish specifications</i> <i>Performance rating of 1 for each applicable task</i></p>	70

**COURSE FAB1110: BAR & TUBULAR FABRICATION** (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>Types of Bar and Tubular Stock</li> <li>Layout</li> <li>Cutting</li> <li>Bending</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>identify common size and shapes of bar pipe and tubular stock</li> <li>identify common methods of laying out and marking stock</li> <li>describe typical methods of cutting bar and tubular stock to length</li> <li>describe the most appropriate way to safely store and handle bar and tubular stock</li> <li>describe how to form:                             <ul style="list-style-type: none"> <li>eyes</li> <li>circles</li> <li>scrolls</li> <li>square and zero bend radii using a metal bender</li> </ul> </li> <li>describe how to calculate the bend allowance for bar and tubular stock</li> </ul>	<p>This course can be combined with other courses, such as FAB1100: Fabrication Principles, FAB2110: Forging Fundamentals and/or a welding course.</p> <p>Discuss the use of:</p> <ul style="list-style-type: none"> <li>– a scribe</li> <li>– soapstone</li> <li>– acid pencil</li> <li>– bluing.</li> </ul> <p>Demonstrate or describe processes, such as:</p> <ul style="list-style-type: none"> <li>– flamecutting</li> <li>– abrasive cutting</li> <li>– mechanical cutting</li> <li>– shearing.</li> </ul>

**COURSE FAB1110: BAR & TUBULAR FABRICATION (continued)**

Concept	Specific Outcomes	Notes
<ul style="list-style-type: none"> <li>• Bending (continued)</li> <li>• Fastening</li> <li>• Finishing</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• describe when heat is required to bend a bar or tube</li> <li>• research appropriate fastening techniques using:               <ul style="list-style-type: none"> <li>– mechanical fasteners</li> <li>– welding processes</li> </ul> </li> <li>• describe how to prefinish and finish a bar/tubular product to prevent corrosion and to improve appearance.</li> </ul>	<p>Have the students compare the quality of a spray coating to powder coating.</p>
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Bend Allowance</li> <li>• Work Scheduling</li> </ul>	<ul style="list-style-type: none"> <li>• calculate the bend allowance for a given radius</li> <li>• create a material list and work schedule from a shop drawing.</li> </ul>	
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Health and Safety</li> <li>• Material Processing</li> </ul>	<ul style="list-style-type: none"> <li>• demonstrate the safe use of hand and power assisted equipment</li> <li>• describe health and safety issues associated with the use of finishing materials</li> <li>• describe a safety plan in case of accident</li> <li>• demonstrate basic skills related to:               <ul style="list-style-type: none"> <li>– laying out and marking stock</li> <li>– cutting stock to length</li> <li>– bending arcs and angles</li> <li>– fastening components</li> <li>– finishing the product.</li> </ul> </li> </ul>	<p>Projects suitable for this course include:</p> <ul style="list-style-type: none"> <li>– ornamental furniture,</li> <li>– railings</li> <li>– security bars</li> <li>– racks</li> <li>– brackets.</li> </ul>
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• prepare a record of completed activities within a portfolio.</li> </ul>	

