

**COURSE FAB1100: FABRICATION PRINCIPLES****Level:** Introductory**Theme:** Fabrication Processes**Prerequisite:** FAB1010 Fabrication Tools & Materials**Description:** Students investigate and apply fundamental principles of fabrication to build an artifact or structure from common structural materials.**Parameters:** Access to a materials work centre complete with basic hand tools.**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 and describe the principles of separating, forming and combining materials</li> <li>• describe the characteristics and give examples of permanent, semipermanent and temporary fastening systems</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>• written or oral response that accurately describes the processes used in fabricating a product, such as separating, forming and combining (joining) techniques.</li> </ul> <p><i>Assessment Tool</i> <i>Response Assessment: Principles of Fabrication, FAB1100-1</i></p> <p><i>Standard</i> <i>Response rating of 1</i></p> <ul style="list-style-type: none"> <li>• analysis of a given fastening technique in relation to its: <ul style="list-style-type: none"> <li>– serviceability</li> <li>– strength</li> <li>– appearance</li> <li>– ease and cost of production.</li> </ul> </li> </ul> <p><i>Assessment Tool</i> <i>Issue Analysis: Fastening Systems, FAB1100-2</i></p> <p><i>Standard</i> <i>Performance rating of 1 for each applicable task</i></p>	<p>10</p> <p>15</p>

**COURSE FAB1100: FABRICATION PRINCIPLES (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 fabrication skills and techniques, using simple hand and power tools</li>   <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>• the completion of a simple product that uses one or more separating, forming and combining (joining) techniques.</li> </ul> <p><i>Assessment Tool</i>  <i>Assessment Framework: Product Assessment, FABPRD</i></p> <p><i>Standard</i>  <i>The product should meet or exceed an “acceptable” level of quality and be completed within the appropriate time and cost limitations</i>  <i>Performance rating of 1 for each applicable task</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 style="text-align: center;">75</p>           <p style="text-align: center;">Integrated throughout</p>

Concept	Specific Outcomes	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>• Measuring and Layout</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• identify and describe measurement and layout tools that can be used to: <ul style="list-style-type: none"> <li>– measure and mark a straight line on a metal surface</li> <li>– make an angle of 45° and 90°</li> <li>– create arcs and circles</li> <li>– measure the inside and/or outside dimensions of pipe, round and square stock</li> </ul> </li> </ul>	<p>This course covers many of the bench metal practices. It can be taught along with other Fabrication Studies courses.</p>

**COURSE FAB1100: FABRICATION PRINCIPLES (continued)**

Concept	Specific Outcomes	Notes
<ul style="list-style-type: none"> <li>• Shaping Materials</li> <li>• Separating</li> <li>• Forming</li> <li>• Combining</li> <li>• Conditioning</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• list and describe three distinct ways of changing the shape of a material; e.g.:               <ul style="list-style-type: none"> <li>– separating</li> <li>– forming</li> <li>– combining (joining)</li> </ul> </li> <li>• describe and give examples of tools that:               <ul style="list-style-type: none"> <li>– shear</li> <li>– chip</li> <li>– abrade</li> </ul> </li> <li>• identify other current and emerging processes that use:               <ul style="list-style-type: none"> <li>– heat</li> <li>– light</li> <li>– chemicals</li> </ul>               to shape a material             </li> <li>• outline principal methods of forming materials by:               <ul style="list-style-type: none"> <li>– bending or twisting</li> <li>– forging</li> <li>– casting</li> </ul> </li> <li>• list and describe common types of mechanical fasteners that are used with metal products</li> <li>• identify and describe typical bonding techniques that are used to combine metals; e.g.:               <ul style="list-style-type: none"> <li>– soldering</li> <li>– braze welding</li> <li>– bonding</li> </ul> </li> <li>• describe when to use permanent, semipermanent and temporary fastening techniques</li> <li>• explain why it may be necessary to change the physical state of some materials before they can be formed</li> </ul>	<p>Use available equipment to illustrate these processes.</p> <p>This is a good place to introduce students to soldering and resistance welding techniques; conventional welding is covered in other introduction courses.</p> <p>Threaded fasteners are a good example of temporary fasteners. Consider thread cutting using a tap and die set at this point.</p>

**COURSE FAB1100: FABRICATION PRINCIPLES (continued)**

Concept	Specific Outcomes	Notes
<ul style="list-style-type: none"> <li>• Finishing</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• research processes that can be used to:               <ul style="list-style-type: none"> <li>– polish</li> <li>– coat</li> <li>– plate a surface to protect or improve the appearance of a product.</li> </ul> </li> </ul>	
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Health and Safety</li> <li>• Process Identification</li> </ul>	<ul style="list-style-type: none"> <li>• describe principles of shop safety</li> <li>• describe a safety plan in case of accident</li> <li>• for a given product design, describe the appropriate processes and tools to measure, layout, shape, condition and finish the materials</li> <li>• prepare a material list and sequence of events to fabricate a given product design.</li> </ul>	<p>Products to consider include:</p> <ul style="list-style-type: none"> <li>– key fob</li> <li>– pendant</li> <li>– trivet</li> <li>– paperweight</li> <li>– tray</li> <li>– box.</li> </ul>
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Material processing</li> </ul>	<ul style="list-style-type: none"> <li>• demonstrate basic skills related to separating, combining and forming processes.</li> </ul>	
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• list and describe a variety of occupations and trades related to metal fabrication</li> <li>• prepare a record of completed activities within a portfolio.</li> </ul>	