

COURSE FAB1120: FOUNDRY 1 (ONE-PIECE PATTERN)**Level:** Introductory**Theme:** Production Systems and Processes**Prerequisite:** FAB1010 Fabrication Tools & Materials**Description:** Students develop the basic skills required to produce a simple one-piece pattern, a sand mold and a finished casting.**Parameters:** Access to a materials work centre complete with foundry supplies and equipment, and to instruction from an individual with specialized training in basic foundry.**Curriculum and Assessment Standards**

General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none"> recognize health and safety hazards associated with casting metal, and take preventive measures to avoid accidents and personal injury to self and others demonstrate basic pattern making skills to make a one-piece mold 	<i>Assessment of student achievement should be based on:</i> <ul style="list-style-type: none"> observed performance in a typical work setting, related to: <ul style="list-style-type: none"> appropriate selection and use of personal protective equipment maintenance of a clean and tidy workstation safe use of equipment and materials completion of a simple one-piece pattern. 	10
	<i>Assessment Tool</i> <i>Product Assessment: Sand Casting, FAB1120-1</i> <i>Standard</i> <i>The pattern should incorporate the appropriate fillets, sufficient draft to allow for easy extraction and allowance for shrinkage</i> <i>Performance rating of 1 for each applicable task</i>	50

COURSE FAB1120: FOUNDRY 1 (ONE-PIECE PATTERN) (continued)

Concept	Specific Outcomes	Notes
<ul style="list-style-type: none"> • Foundry Processes and Products (continued) • Mold Making • Health and Safety • Pattern Making 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • describe the major casting processes; e.g.: <ul style="list-style-type: none"> – sand casting – die casting – investment casting • identify and describe the parts of a sand mold • describe the advantages and disadvantages of a water-moistened sand and an oil-bonded sand • explain why a flux is used when a metal is melted • identify common tools and equipment used in sand casting • outline the basic procedures used to make a mold with a one-piece pattern • describe the operation of a foundry furnace and safe methods of handling and pouring molten metal • list the types of personal protective equipment and the circumstances under which it should be worn • describe a safety plan in case of accident • list and describe the types of patterns that are used to make sand molds • identify the types of materials that are suitable for making a pattern. • design or locate an article that can be cast using a one-piece pattern • select a suitable pattern making material 	<p>Oil-bonded sands are recommended for school use. They produce less gassing and can be left for several days before pouring.</p> <p>Explain the dangers of using a mold that has too much moisture content and is improperly vented and packed.</p> <p>Demonstrate how a pattern is made and explain why it is important for a pattern to have the proper draft and shrinkage allowances.</p>

COURSE FAB1120: FOUNDRY 1 (ONE-PIECE PATTERN) (continued)

Concept	Specific Outcomes	Notes
<ul style="list-style-type: none"> • Casting 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • describe the kind and amount of metal that is required for a given casting • describe the melting point and appropriate flux for a specified metal • evaluate the quality of sand and foundry metal. 	<p>Check to see that these conditions have been met before proceeding.</p>
<p>Implementation</p> <ul style="list-style-type: none"> • Material Processing 	<ul style="list-style-type: none"> • use the appropriate tools, materials and process to: <ul style="list-style-type: none"> – make a pattern – condition the sand – create a mold – heat and pour the molten metal – remove and finish the casting. 	<p>Students may need to be reminded not to over pack the mold.</p> <p>Ensure that the heating and pouring of metal takes place in a well ventilated area and that students use the proper personal protective equipment.</p>
<p>Assessment</p> <ul style="list-style-type: none"> • Quality Control • Career Preparation 	<ul style="list-style-type: none"> • research a completed casting and check to see that it is clean, free of voids and finished appropriately • prepare a record of completed activities within a portfolio. 	