

COURSE FAB3010: MATERIALS TESTING**Level:** Advanced**Theme:** Materials and Structures**Prerequisite:** FAB1010 Fabrication Tools & Materials**Description:** Students are introduced to the principles of materials testing, and to the development and evaluation of a mechanical materials test.**Parameters:** Access to common hand and power assisted tools, and to instruction from an individual with specialized training in material testing.**Supporting Courses:** FAB1100 Fabrication Principles
DES1020 The Design Process [Design Studies Strand]**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"> describe the purpose and nature of materials testing apply testing principles to construct or use a piece of materials testing apparatus test and compare the properties of common materials used in construction and fabrication demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> the description of two or more different types of materials tests and testing procedures identification and development of a piece of test apparatus results of a test on three different materials. <p><i>Assessment Tool</i> <i>Lab Investigations: Testing Materials, FAB3010–1</i></p> <p><i>Standard</i> <i>The apparatus is to be safe, easily used and calibrated: results should be consistent with other forms of testing equipment. Results should be effectively communicated and be consistent with current findings</i> <i>Performance rating of 3 for each applicable task</i></p> <ul style="list-style-type: none"> observations of individual effort and interpersonal interaction during the learning process. <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>20</p> <p>50</p> <p>30</p> <p>Integrated throughout</p>

COURSE FAB3010: MATERIALS TESTING (continued)

Concept	Specific Outcomes	Notes
<p>Orientation</p> <ul style="list-style-type: none"> • Types of Tests • Testing Results • Health and Safety 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • identify and describe common methods of testing materials; e.g.: <ul style="list-style-type: none"> – non-destructive – destructive • explain how test results are recorded and communicate a plan showing how to anticipate the results of a test • identify common hazards associated with the use of a specific tool, material and/or process • identify and correct potential hazards within the working environment • describe a safety plan in case of an accident. 	<p>Discuss the use of non-destructive tests, such as:</p> <ul style="list-style-type: none"> – magnetic particles – liquid dye – X-ray – ultrasonic. <p>Describe methods of testing for:</p> <ul style="list-style-type: none"> – hardness – tensile strength – ductility – metal fatigue. <p>Explain why material testing is important.</p>
<p>Planning and Management</p> <ul style="list-style-type: none"> • Test Equipment • Complete Tests 	<ul style="list-style-type: none"> • design a piece of testing apparatus or test procedure • create safety controls • construct testing devices <li style="text-align: center;"><i>or</i> • analyze an existing piece of test equipment and describe its: <ul style="list-style-type: none"> – purpose – operation – method of calibration and data recovery • identify type of test, calibration and data recovery • prepare the materials as required. 	<p>Have students design and build a piece of test apparatus that can be used to test a particular material property, such as shear strength, torsion, hardness and impact.</p>

COURSE FAB3010: MATERIALS TESTING (continued)

Concept	Specific Outcomes	Notes
<p>Implementation</p> <ul style="list-style-type: none"> • Testing 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • conduct a given test on a variety of materials and record the test results. 	
<p>Assessment</p> <ul style="list-style-type: none"> • Quality Control/Reliability • Career Information • Career Preparation 	<ul style="list-style-type: none"> • compare the data obtained from the materials tested to anticipated results • explain the reliability of the testing procedure • identify the advantages/disadvantages of test being carried out • identify further training and career opportunities related to material testing • prepare a record of completed activities within a portfolio. 	<p>Students should be encouraged to visit a test lab either in industry or in a post-secondary institution.</p>

