

MODULE CURRICULUM AND ASSESSMENT STANDARDS:

SECTION E: INTERMEDIATE LEVEL

The following pages define the curriculum and assessment standards for the intermediate level of Construction Technologies.

Intermediate level modules help students build on the competencies developed at the introductory level and focus on developing more complex competencies. They provide a broader perspective, helping students recognize the wide range of related career opportunities available within the strand.

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MODULE CON2010: SITE PREPARATION

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1070 Building Construction

Module Description: Students develop the knowledge and skills to acquire a building permit and to locate and prepare a site for excavation and foundation work.

Module Parameters: Access to a building site and/or construction facility and to instruction from an individual with specialized training in carpentry.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify and describe typical building site layout and excavation processes 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> presentation of an independently researched report that includes: <ul style="list-style-type: none"> – identification and use of batterboards, building lines, plumb bob, builder’s level and transit – use of the 3, 4, 5 principle (Pythagorean Theorem) – description of excavation methods and equipment – safety precautions with an emphasis on shoring. <p><i>Assessment Tool</i> <i>Research Process: Preparing a Building Site, CON2010–1</i></p> <p><i>Standard</i> <i>Performance rating of 2 for each applicable task</i></p>	15
<ul style="list-style-type: none"> complete an application for a building permit 	<ul style="list-style-type: none"> completion of a building permit using a recognized form that includes all information required to meet local building standards 	15
<ul style="list-style-type: none"> apply site preparation skills to assist in the location of building site lines and features 	<ul style="list-style-type: none"> demonstration of site preparation and teamwork skills to: <ul style="list-style-type: none"> – establish building lines using batterboards and plumb bobs – lay out building features using a builder’s level or transit and the 3, 4, 5 squaring method. <p><i>Assessment Tool</i> <i>Activity Assessment: Building Site Layout, CON2010–2</i></p> <p><i>Standard</i> <i>Specific dimensions are within ± 3 mm over 6 metres</i> <i>Performance rating of 2 for each applicable task</i></p>	70

MODULE CON2010: SITE PREPARATION (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</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>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> Building Regulations Site Selection Site Layout Lay Out Tools 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> explain the purpose of local, provincial and national building regulations identify local zoning regulations that limit the type, size and location of new buildings identify the parameters for selecting a building site describe a typical method of establishing lot and building lines as well as grade levels explain the use of a plumb bob, builder's level, transit and string line. 	<p>Point out that in addition to structural regulations, building codes also deal with fire and health issues.</p> <p>Students should be able to use the 3-4-5 rule, builder's level, transit and batterboards.</p> <p>Discuss other methods of leveling such as hydro and laser levelling techniques.</p>
<p>Planning and Management</p> <ul style="list-style-type: none"> Estimating Worker Safety 	<ul style="list-style-type: none"> identify the information that is needed to complete an application for a building permit use site plan and elevation drawings to determine the amount of soil to be excavated locate and mark all underground and overhead services identify soil conditions that may require shoring. 	<p>Discuss the importance of having the utility companies mark the location of all underground services.</p>

MODULE CON2010: SITE PREPARATION (continued)

Concept	Specific Learner Expectations	Notes
<p>Implementation</p> <ul style="list-style-type: none"> • Building Layout 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • use an approved method to: <ul style="list-style-type: none"> – position batterboards – locate lot and building lines – excavate – establish locations and elevations for wall and pier footings. 	<p>This work can be simulated if a construction site is not available. In this case, a tour of a construction site will enhance this module.</p>
<p>Assessment</p> <ul style="list-style-type: none"> • Career Information • Career Preparation 	<ul style="list-style-type: none"> • identify career opportunities related to the work of a/an: <ul style="list-style-type: none"> – developer – urban planner – surveyor – excavator • maintain a record of completed activities within a portfolio. 	

MODULE CON2020: CONCRETE FORMING

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1070 Building Construction

Module Description: Students develop knowledge and skills related to the preparation and construction of a concrete foundation.

Module Parameters: Access to a building site and/or construction facility and to instruction from an individual with specialized training in carpentry.

Supporting Module: CON2010 Site Preparation

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> list and describe factors that affect footing and wall design identify and describe common forming materials and processes 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> a written or oral response that correctly identifies factors that affect footing and wall design, types of forms, form materials, ties and release agents. <p><i>Assessment Tool</i> <i>Response Assessment: Concrete Forming, CON2020-1</i></p> <p><i>Standard</i> <i>Terminology should be consistent with that used in Canadian Wood-Frame House Construction</i> <i>Response rating of 2</i></p>	25
<ul style="list-style-type: none"> apply concrete forming skills to assist in forming and placing a concrete foundation 	<ul style="list-style-type: none"> the completion of a project that incorporates full-size formwork or development of a scale model. <p><i>Assessment Tool</i> <i>Activity Assessment: Concrete Forming and Placing, CON2020-2</i></p> <p><i>Standard</i> <i>Installation of forms is consistent with accepted trade practice. Components are assembled to meet overall specifications to a tolerance of ± 3 mm over 6 metres. Forms are reinforced to maintain their position during placement. The concrete is consolidated to prevent honeycombing and is finished appropriate to the floor system. The concrete is allowed to cure properly before stripping in a manner that preserves the integrity of the footing and wall section</i> <i>Performance rating of 2 for each applicable task</i></p>	75

MODULE CON2020: CONCRETE FORMING (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</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>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> Soil Condition Footing and Wall Forming 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe how soils are tested for: <ul style="list-style-type: none"> resistance to penetration shear resistance moisture content explain how soil, water and frost conditions affect the design and construction of a foundation as well as excavation and safety procedures explain the purpose of a footing describe one or more common techniques to form footings, walls and piers describe methods of reinforcing a footing and wall section identify the parts of a typical concrete wall form explain the difference between box-sill and cast-in-place construction identify release agents and coatings used on forms 	<p>Discuss the load-bearing strengths of different soil types and explain how the strengths affect the footing design.</p> <p>Explain why footings must be monoliths and be located below the frost line whenever possible.</p> <p>Investigate the use of built-in-place and prefabricated forming systems.</p> <p>Examine methods used to create corner assemblies and to secure the kickplate.</p>

MODULE CON2020: CONCRETE FORMING (continued)

Concept	Specific Learner Expectations	Notes
<ul style="list-style-type: none"> • Concrete Mixer 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • describe types of cement and concrete mixers used in footing and wall systems. 	
<p>Planning and Management</p> <ul style="list-style-type: none"> • Print Reading • Estimating 	<ul style="list-style-type: none"> • describe factors that determine the size and strength of a footing and wall components • prepare a detailed list of materials and supplies to form a footing and wall • calculate the volume of concrete required for a footing and wall component. 	
<p>Implementation</p> <ul style="list-style-type: none"> • Form Work, Concrete Placement and Finishing 	<ul style="list-style-type: none"> • use the appropriate tools and materials to: <ul style="list-style-type: none"> – construct a set of forms for a rectangular footing and wall section – square level, align and brace – place, consolidate and finish a concrete footing and wall section – make provisions to attach a sill plate if necessary – seal walls below ground level and install weeping tile – back file taking account lateral pressure. 	<p>Note the importance of wearing personal protective equipment while on the work site.</p>
<p>Assessment</p> <ul style="list-style-type: none"> • Career Information • Career Preparation 	<ul style="list-style-type: none"> • identify opportunities for training and business ventures related to concrete forming, placing and finishing • maintain a record of completed activities within a portfolio. 	<p>Discuss alternative methods of building a concrete foundation using unit masonry, precast and polystyrene blocks.</p>

MODULE CON2030: ALTERNATIVE FOUNDATIONS

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1070 Building Construction

Module Description: Students develop basic knowledge and skills related to the design and construction of an alternative foundation system.

Module Parameters: Access to a building site and/or construction facility and to instruction from an individual with specialized training in carpentry.

Supporting Module: CON2020 Concrete Forming

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify and describe the components of an alternative foundation system identify the health hazards and precautions related to the use of engineered materials apply construction skills to assist in the design/construction of an alternative foundation system 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> a written or oral presentation that correctly identifies the materials and design features of one or more alternative foundations systems <p style="text-align: center;"><i>and</i></p> <ul style="list-style-type: none"> knowledge of product labels for safe use and disposal of alternative foundations materials. <p><i>Assessment Tool</i> <i>Presentations/Reports: Wood Foundations, CON2030-1</i></p> <p><i>Standard</i> <i>Performance rating of 2 for each applicable task</i></p>	25
	<ul style="list-style-type: none"> observation of the construction and placement of an alternative foundation or display model. <p><i>Assessment Tool</i> <i>Activity Assessment: Wood Foundation Framing, CON2030-2</i></p> <p><i>Standard</i> <i>Foundation/display model is built according to local code requirements, components are assembled and appropriately braced. Walls are moisture proofed and correctly back filled. Overall dimensions are within ± 3 mm over 6 meters</i> <i>Performance rating of 2 for each applicable task</i></p>	75

MODULE CON2030: ALTERNATIVE FOUNDATIONS (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</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>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> Alternative Systems and Materials Related Building Codes System Design 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe alternative foundation systems and materials such as: <ul style="list-style-type: none"> concrete masonry block preserved wood foam form identify local building codes that pertain to the design and construction of alternative foundation systems label and describe the parts of a typical preserved wood, masonry block and/or foam form foundation list and describe the factors that determine the design and construction of a footing and wall section for one or more alternative systems describe levelling and plumbing techniques that are used with a particular foundation system describe recommended methods that are used to control drainage and damp-proof an alternative foundation system describe the flooring options that can be used with an alternative foundation system. 	<p>Discuss the advantages and disadvantages of using an alternate foundation system.</p> <p>Explain why walls should be designed to take advantage of block/sheet sizes.</p> <p>Discuss typical methods to attach a sill plate to a given wall system.</p>

MODULE CON2030: ALTERNATIVE FOUNDATIONS (continued)

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> • Structural Design • Health and Safety 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • prepare a sketch of an alternative foundation that identifies construction details, size and spacing of component, as well as sealing, drainage and damp-proofing features • identify suitable personal protective equipment and recommended procedures related to the use of alternative materials • describe suitable methods used to dispose of scrap materials. 	<p>Review the safe use of power tools common to construction activities.</p> <p>Refer to product labels and material safety data sheets for appropriate directions when using wood preservatives.</p> <p>Students should avoid prolonged inhalation of dust. Wood preservatives should not be allowed to come in contact with skin or food.</p> <p>Treated wood and foam scraps should not be burned in open fires or fireplaces.</p>
<p>Implementation</p>	<ul style="list-style-type: none"> • use the appropriate tools, materials and processes to: <ul style="list-style-type: none"> – level the footings and create the necessary drainage system – lay out and assemble the wall section – seal joints and apply a vapour seal/ damp-proofing – backfill without damaging the moisture barrier. 	<p>Discuss the safe use of liquid preservatives.</p>
<p>Assessment</p> <ul style="list-style-type: none"> • Career Information • Career Preparation 	<ul style="list-style-type: none"> • identify opportunities for entrepreneurial ventures and further training associated with alternate foundation systems • maintain a record of completed activities within a portfolio. 	

MODULE CON2040: FRAMING SYSTEMS 1 (FLOOR & WALL)**Level:** Intermediate**Theme:** Building Systems (Processes and Applications)**Prerequisite:** CON1070 Building Construction**Module Description:** Students develop basic framing knowledge and skills associated with the construction of a floor and wall system.**Module Parameters:** Access to a building site and/or construction facility and to instruction from an individual with specialized training in carpentry.**Curriculum and Assessment Standards**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify and describe the parts of a floor and wall framing system 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> a written or oral response that correctly identifies and describes: <ul style="list-style-type: none"> – floor and wall framing components – framing techniques. <p><i>Assessment Tool</i> <i>Response Assessment: Floor and Wall Framing, CON2040–1</i></p> <p><i>Standard</i> <i>Response rating of 2</i></p>	20
<ul style="list-style-type: none"> read and interpret the appropriate drawings and specifications to create a floor and wall framing and sheathing estimate 	<ul style="list-style-type: none"> a detailed list and cost of materials taken from a given working drawing of a floor and wall component. <p><i>Assessment Tool</i> <i>Activity Assessment: Floor and Wall Framing, CON2040–2</i></p> <p><i>Standard</i> <i>Estimate includes allowances for floor and wall openings, over-run and waste considerations</i> <i>Performance rating of 2 for each applicable task</i></p>	20

MODULE CON2040: FRAMING SYSTEMS 1 (FLOOR & WALL) (continued)

Concept	Specific Learner Expectations	Notes
<ul style="list-style-type: none"> • Floor and Wall Structures 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • identify the parts and purpose of a typical wall and floor framing system • compare platform framing to post and beam construction • describe the consequences of a floor system that has not been sized or constructed properly • identify and describe the proper use of portable electric and air activated tools. 	<p>Discuss the relationship of the floor and wall design to the overall strength and stability of a building.</p>
<p>Planning and Management</p> <ul style="list-style-type: none"> • Floor and Wall Design • Estimating 	<ul style="list-style-type: none"> • use a frame structure drawing to determine the location, type and sizes of joists, beams, sills and headers as well as subflooring requirements • use a wall frame elevation to determine the size and locations of studs, headers and rough size openings • prepare a quantity survey for a floor and wall section. 	
<p>Implementation</p> <ul style="list-style-type: none"> • Health and Safety • Tools and Processes 	<ul style="list-style-type: none"> • demonstrate proper methods of lifting materials and components • use proper personal protective equipment • cover openings and build railings where needed • use the appropriate hand tools and portable equipment to: <ul style="list-style-type: none"> – lay out components – cut and assemble floor joists and wall sections – square floor and wall components – install subflooring and sheathing – lay out and assemble a wall section – erect, plumb and brace wall sections. 	<p>Emphasize the importance of safety on the work site.</p> <p>Review the safe use of air and electrically operated tools.</p>

MODULE CON2040: FRAMING SYSTEMS 1 (FLOOR & WALL) (continued)

Concept	Specific Learner Expectations	Notes
Assessment <ul style="list-style-type: none">• Career Information• Career Preparation	<i>The student should:</i> <ul style="list-style-type: none">• identify the trade qualifications and employment opportunities related to residential framing• maintain a record of completed activities within a portfolio.	

MODULE CON2050: ROOF STRUCTURES 1 (FRAMING & FINISHING)

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1070 Building Construction

Module Description: Students develop basic knowledge and skills associated with framing and finishing a simple roof system.

Module Parameters: Access to a building site and/or construction facility and to instruction from an individual with specialized training in carpentry.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none">identify and describe the different styles and parts of a roof system	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none">a written or oral response that correctly identifies and describes basic roof styles and roofing components. <p><i>Assessment Tool</i> <i>Response Assessment: Roof Construction, CON2050-1</i></p> <p><i>Standard</i> <i>Response rating of 2</i></p>	10
<ul style="list-style-type: none">read and interpret the appropriate drawings and specifications to create a roof framing and finishing estimate	<ul style="list-style-type: none">description and quantities of materials required to frame, sheath and apply a finished covering on a typical roof. <p><i>Assessment Tool</i> <i>Activity Assessment: Roof Construction, CON2050-2</i></p> <p><i>Standard</i> <i>Estimate includes all allowances for roof openings, over-run and waste requirements</i> <i>Performance rating of 2 for each applicable task</i></p>	20

MODULE CON2050: ROOF STRUCTURES 1 (FRAMING & FINISHING) (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> apply roofing skills to assist in the framing and finishing of a roof structure demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> demonstration of framing and finishing skills. <p><i>Assessment Tool</i> <i>Activity Assessment: Roof Construction, CON2050–2</i></p> <p><i>Standard</i> <i>The roof is framed and covered according to conventional building practice. Specified dimensions are within ± 3 mm over 6 metres</i> <i>Performance rating of 2 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>70</p> <p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> Roof Structures 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> list and describe the common styles of roofs define roof terms such as span, run, rise, slope and overhang describe the parts of a common rafter describe the parts of a typical roof truss describe the advantages of using roof trusses versus standard common rafters list and describe the parts of a boxed cornice identify sheathing grades and types; joint and nailing patterns list and describe the types of roof finishes. 	<p>Focus mainly on simple roof structures and coverings in this module. Intersecting roof structures are covered in CON3050: Roof Structures 2 (Framing & Covering).</p> <p>Discuss issues related to the installation of air/vapour barriers and insulation.</p> <p>Refer to building codes for proper sheathing grades, nail sizes and spacing.</p>

MODULE CON2050: ROOF STRUCTURES 1 (FRAMING & FINISHING) (continued)

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> • Roof Design • Estimating 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • make a roof sketch indicating the location of roof trusses, look-out rafters, bridging, fascia headers, boxed cornices and sheathing patterns • prepare a material list specifying: <ul style="list-style-type: none"> – the size, slope and number of roof trusses or common rafters – thickness and quantities of sheathing – quantities of H-clips and metal anchors – style, colour, weight and quantities of asphalt shingles. 	
<p>Implementation</p> <ul style="list-style-type: none"> • Health and Safety • Tools and Processes 	<ul style="list-style-type: none"> • check condition of ladders before using and observe safe angle ratios • use proper foot and head protection • identify hazards associated with wet or frosty conditions on sloped surfaces • identify safety devices that are used in conjunction with roof construction • use the appropriate tools and equipment to: <ul style="list-style-type: none"> – locate, fasten, square and plumb roof trusses – cut and install common rafters • install look-outs, fascia and braces • apply sheathing and shingling. 	<p>Discuss methods of temporarily and permanently bracing roof trusses.</p> <p>Demonstrate appropriate methods to lay the ridge cap to minimize wind damage.</p>
<p>Assessment</p> <ul style="list-style-type: none"> • Career Information • Career Preparation 	<ul style="list-style-type: none"> • outline the trade qualifications and employment opportunities related to residential framing and roofing • maintain a record of activities within a portfolio. 	

MODULE CON2060: EXTERIOR FINISHING (DOOR, WINDOW & SIDING)**Level:** Intermediate**Theme:** Building Systems (Processes and Applications)**Prerequisite:** CON1070 Building Construction**Module Description:** Students apply and develop basic knowledge of door, window and siding systems and installation skills and procedures.**Module Parameters:** Access to a building site and/or construction facility and to instruction from an individual with specialized training in carpentry.**Curriculum and Assessment Standards**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify and describe common types of exterior doors, windows and siding materials read and interpret the appropriate drawings and specifications to create a door and window schedule and siding estimate 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> a written or oral presentation that correctly identifies at least three different exterior doors, exterior window types and siding materials. <p><i>Assessment Tool</i> <i>Presentations/Reports: Window/Door and Siding Materials, CON2060–1</i></p> <p><i>Standard</i> <i>Performance rating of 2 for each applicable task</i></p> <ul style="list-style-type: none"> development of an accurate exterior door and window schedule and description of materials and quantities of siding required in a given set of plans. <p><i>Assessment Tool</i> <i>Assessment Framework: Activity Assessment, CONACT</i></p> <p><i>Standard</i> <i>Estimate includes all allowances for wall openings, over-run and waste requirements</i> <i>Performance rating of 2 for each applicable task</i></p>	<p>10</p> <p>20</p>

MODULE CON2060: EXTERIOR FINISHING (DOOR, WINDOW & SIDING) (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> • apply finishing skills to install a prehung door, a window unit and siding materials • demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> • demonstration of door, window and siding systems skills. <p><i>Assessment Tool</i> <i>Assessment Framework: Activity Assessment, CONACT</i></p> <p><i>Standard</i> <i>Doors, windows and siding systems are installed in keeping with accepted trade practice and manufacturers' recommendations</i> <i>Performance rating of 2 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 style="text-align: center;">70</p> <p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> • Doors and Windows • Siding Components 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • list and describe common types of exterior doors and windows • identify methods of sizing windows and exterior doors • describe the procedures used to install an exterior door and window • list and describe the components used in conjunction with the installation of vinyl and aluminum siding • describe the purpose and use of building papers and other house wrap materials. 	<p>Explain the advantages and disadvantages of each style of door or window.</p> <p>Stress the importance of making provisions for the siding to expand and contract during heating and cooling.</p>

MODULE CON2060: EXTERIOR FINISHING (DOOR, WINDOW & SIDING) (continued)

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> • Ordering and Estimating 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • use elevation drawings and specifications to develop a door and window schedule • use an elevation drawing to identify the types of siding and cornice materials and estimated amounts. 	<p>Discuss methods used to estimate siding materials.</p>
<p>Implementation</p> <ul style="list-style-type: none"> • Windows and Doors • Exterior Finishes • Health and Safety 	<ul style="list-style-type: none"> • use the appropriate tools and processes to: <ul style="list-style-type: none"> – level, plumb, seal and fasten a prefabricated door and window unit – install exterior finishes – check and secure all scaffolding – observe proper handling and lifting procedures – use appropriate eye and ear protection. 	<p>Refer to building code regulations.</p>
<p>Assessment</p> <ul style="list-style-type: none"> • Career Information • Career Preparation 	<ul style="list-style-type: none"> • identify employment and entrepreneurial opportunities associated with the supply and installation of windows, doors and exterior finishes • maintain a record of completed activities within a portfolio. 	

MODULE CON2070: ELECTRICAL SYSTEMS

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1070 Building Construction

Module Description: Students apply electrical principles, and develop an understanding of residential electrical code requirements and installation procedures.

Module Parameters: Access to a building site and/or construction facility and to instruction from an individual with specialized training in electrical work.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> list and describe the electrical systems and components associated with residential wiring apply wiring principles and code requirements to create a wiring diagram 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> the presentation of a written or oral presentation that identifies and describes the electrical systems found in a typical residence. <p><i>Assessment Tool</i> <i>Presentation/Reports: Electrical Systems, CON2070–1</i></p> <p><i>Standard</i> <i>Performance rating of 2 for each applicable task</i></p>	10
	<ul style="list-style-type: none"> the development of an electrical drawing of a typical room such as a bathroom, living room or bedroom. <p><i>Assessment Tool</i> <i>Activity Assessment: Branch Wiring, CON2070–2</i></p> <p><i>Standard</i> <i>The working drawing uses standard symbols showing the location and type of outlet, light or switch. Connections between switches and lights are shown along with the electrical service entry</i> <i>Performance rating of 2 for each applicable task</i></p>	20

MODULE CON2070: ELECTRICAL SYSTEMS (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> • apply wiring skills to assist in the installation of a residential wiring system • profile a trade or occupation within the electrical field • demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> • installation of an electrical system to include the required switches, lights and outlets found in a typical room. <p><i>Assessment Tool</i> <i>Activity Assessment: Branch Wiring, CON2070–2</i></p> <p><i>Standard</i> <i>Installation meets accepted trade practice and code requirements</i> <i>Performance rating of 2 for each applicable task</i></p> <ul style="list-style-type: none"> • presentation of an occupation profile that outlines: <ul style="list-style-type: none"> – present and future employment opportunities – training centres and entry requirements – description of occupation and working conditions. <p><i>Assessment Tool</i> <i>Research Process: Career Opportunities in Electrical Work: CON2070–3</i></p> <p><i>Standard</i> <i>Performance rating of 2 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>60</p> <p>10</p> <p>Integrated throughout</p>

MODULE CON2070: ELECTRICAL SYSTEMS (continued)

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> • Health and Safety • Electrical Principles • House Wiring Design 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • identify the principal hazards associated with electrical work such as shocks, burns, fire and falls • outline methods that are commonly used to prevent contact with a live electric circuit • identify the nonconducting extinguishing agents that can be used with electrical fires • describe and provide examples of: <ul style="list-style-type: none"> – alternating and direct current – series and parallel circuits • define the terms and explain the relationships between voltage, amperage and resistance in a typical circuit • identify the common types of electrical systems found in a modern home such as lighting, utility, heating, communication and alarm systems • describe the symbols that are used to indicate a wall plug, light fixture, range, dryer plug, etc., on an electrical drawing • identify the code requirements for installing outlets in a kitchen, bathroom, living room and bedroom • list and describe the types of conductors and connection devices that are used in conventional construction • identify design and framing requirements when installing electrical fixtures and wires. 	<p>Our familiarity with the use of electricity in our homes can cause us to forget that electricity can be lethal. Stress the importance of electrical safety.</p> <p>Note that the number of uses and demand for electricity in the home has increased significantly over the past decade.</p>
<p>Planning and Management</p> <ul style="list-style-type: none"> • Wiring Project • Wiring Permit 	<ul style="list-style-type: none"> • make a wiring diagram for a typical residential wiring project • prepare a list of materials for a wiring project • complete an application for a wiring permit. 	<p>Obtain a local wiring permit application form.</p>

MODULE CON2070: ELECTRICAL SYSTEMS (continued)

Concept	Specific Learner Expectations	Notes
<p>Implementation</p> <ul style="list-style-type: none"> • House Wiring • Testing 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • use the appropriate tools, materials to frame and install a typical residential wiring circuit such as a: <ul style="list-style-type: none"> – general purpose and split receptacle – single-pole and three-way switch – ceiling fixture – outside outlet – service panel • test a circuit for power, grounding and continuity. 	<p>Provide students with wiring frame or mock-up panels to complete tasks.</p> <p>Have students understand the purpose of a GFI circuit breaker and receptacle.</p>
<p>Assessment</p> <ul style="list-style-type: none"> • Career Information • Career Preparation 	<ul style="list-style-type: none"> • identify the employment and business opportunities related to an electrical trade or occupation • identify personal interests and abilities related to making realistic career choices • maintain a record of completed activities within a portfolio. 	

MODULE CON2080: PLUMBING SYSTEMS

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1070 Building Construction

Module Description: Students develop basic knowledge and skills to fabricate and make repairs to residential drainage, waste, vent (DWV) and water supply systems.

Module Parameters: Access to a building site and/or construction facility and to instruction from an individual with specialized training in plumbing.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify and describe the parts of a residential plumbing system 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> a written or oral presentation that correctly identifies the: <ul style="list-style-type: none"> – components of a water supply system – drainage, waste and vent components – types of pipe and fittings used on each of these systems. <p><i>Assessment Tool</i> <i>Presentations/Reports: Common Plumbing Systems, CON2080–1</i></p> <p><i>Standard</i> <i>Performance rating of 2 for each applicable task</i></p>	10
<ul style="list-style-type: none"> create a drawing of a water supply, drainage, waste and vent system for a typical plumbing fixture 	<ul style="list-style-type: none"> a plan for a water supply and DWV system for a household fixture in a bathroom or kitchen. <p><i>Assessment Tool</i> <i>Activity Assessment: Installing a Plumbing Fixture, CON2080–2</i></p> <p><i>Standard</i> <i>The plan is consistent with conventional plumbing practice and code requirements</i></p>	15

MODULE CON2080: PLUMBING SYSTEMS (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> • apply plumbing skills to assist in the installation of a water supply, waste and vent system • profile a trade or occupation within the plumbing field • demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> • demonstrations of appropriate work skills related to installation of a plumbing fixture. <p><i>Assessment Tool</i> <i>Activity Assessment: Installing a Plumbing Fixture, CON2080–2</i></p> <p><i>Standard</i> <i>Installation practices should correspond to those accepted in the plumbing industry</i> <i>Performance rating of 2 for each applicable task</i></p> <ul style="list-style-type: none"> • presentation of an occupation profile that outlines: <ul style="list-style-type: none"> – description of the occupation and working conditions – employment opportunities – training centres and entry requirements. <p><i>Assessment Tool</i> <i>Research Process: Career Opportunities in Plumbing, CON2080–3</i></p> <p><i>Standard</i> <i>Performance rating of 2 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>65</p> <p>10</p> <p>Integrated throughout</p>

MODULE CON2080: PLUMBING SYSTEMS (continued)

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> • Residential Plumbing Systems • Plumbing Design • Installation Procedures 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • identify and describe the piping systems in a conventional residence such as water supply, vent, drainage and gas supply • examine the principles related to proper sizing, venting, pressures and drainage angles • investigate and compare the use of iron, copper, brass and plastic components • identify the symbols that are used to depict common fixtures and fittings • identify the code requirements for installing a residential plumbing system • identify appropriate methods of cutting, iron, copper, steel and plastic pipe • describe and demonstrate approved methods of joining pipe using solder, adhesives, mechanical joints and threaded fasteners • determine when to use face-to-face, centre-to-centre and shoulder-to-shoulder measurements. 	
<p>Planning and Management</p> <ul style="list-style-type: none"> • Layout • Health and Safety 	<ul style="list-style-type: none"> • sketch a typical water supply and DWV system for a typical household fixture • use a plumbing layout drawing to create a detailed material list and cost estimate • locate and use the appropriate fire extinguisher for a given type of fire • describe the health hazards associated with the use of solder and plastic adhesives. 	<p>Point out the need to comply with building code regulations.</p>

MODULE CON2080: PLUMBING SYSTEMS (continued)

Concept	Specific Learner Expectations	Notes
<p>Implementation</p> <ul style="list-style-type: none"> • Material and Tool Processes 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • use the appropriate tools, materials and techniques to: <ul style="list-style-type: none"> – rough-in a water supply, DWV system – pressure-test a supply system – install a fixture and connect supply and drainage lines. 	
<p>Assessment</p> <ul style="list-style-type: none"> • Career Information • Career Preparation 	<ul style="list-style-type: none"> • outline the trade qualifications and employment opportunities related to the plumbing trade • analyze personal interests and abilities related to making realistic career choices • maintain a record of completed activities within a portfolio. 	

MODULE CON2090: CLIMATE CONTROL SYSTEMS

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1070 Building Construction

Module Description: Students investigate common heating, ventilating and air conditioning (HVAC) systems and principles, and participate in the installation or maintenance of one of these systems.

Module Parameters: Access to a building site and/or construction facility and to instruction from an individual with specialized training in sheet metal and climate control installation/service.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> list and describe the major components of a typical heating, ventilating and air conditioning system prepare a preventive maintenance schedule for a heating, ventilating and/or air conditioning system 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> the accurate identification and description of the components given a representation of a typical residential HVAC system. <p><i>Assessment Tool</i> <i>Response Assessment: Heating, Ventilating and Cooling Systems, CON2090-1</i></p> <p><i>Standard</i> <i>Response rating of 2</i></p> <ul style="list-style-type: none"> a comprehensive preventive maintenance schedule for a given component within a HVAC system. <p><i>Assessment Tool</i> <i>Activity Assessment: Maintaining/Installing a HVAC System, CON2090-2</i></p> <p><i>Standard</i> <i>The schedule should take into account the frequency and amount of use, condition of use and manufacturer's recommendations</i> <i>Performance rating of 2 for each applicable task</i></p>	<p>10</p> <p>20</p>

MODULE CON2090: CLIMATE CONTROL SYSTEMS (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> • service or install a heating, ventilating and/or air conditioning system • profile a trade or occupation within the heating and air conditioning fields • demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> • demonstration of skills related to the installation and/or servicing of a typical residential HVAC component. <p><i>Assessment Tool</i> <i>Activity Assessment: Maintaining/Installing a HVAC System, CON2090–2</i></p> <p><i>Standard</i> <i>Installation and servicing procedure are performed according to the manufacturer’s recommendations</i> <i>Performance rating of 2 for each applicable task</i></p> <ul style="list-style-type: none"> • presentation of an occupation/trade profile that outlines: <ul style="list-style-type: none"> – description of the occupation and working conditions – present and future employment opportunities – training centres and requirements. <p><i>Assessment Tool</i> <i>Research Process: Career Opportunities in Heating & Air Conditioning, CON2090–3</i></p> <p><i>Standard</i> <i>Performance rating of 2 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>60</p> <p>10</p> <p>Integrated throughout</p>

MODULE CON2090: CLIMATE CONTROL SYSTEMS (continued)

Concept	Specific Learner Expectations	Notes
<p>Assessment</p> <ul style="list-style-type: none"> • Career Information • Career Preparation 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • identify employment and further training opportunities related to heating and air conditioning • analyze personal interests and abilities related to making realistic career choices • maintain a record of completed activities within a portfolio. 	

MODULE CON2100: AGRI-STRUCTURES

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1070 Building Construction

Module Description: Students apply construction principles and skills, and use preengineered designs to build a structure to be used for agricultural purposes.

Module Parameters: Access to a building site and/or construction facilities and to instruction from an individual with specialized training in carpentry or metal work.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify the major issues that must be addressed when designing an agri-structure read and interpret the appropriate drawings and specifications to create a material and cost estimate construct a structure for use in agriculture 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> presentation of a written project brief that identifies and describes the major factors to be considered when designing, planning and constructing an agri-structure, such as: <ul style="list-style-type: none"> human and environmental safety animal comfort and safety crop protection cost of construction appropriate design selection, modification or creation of an agri-structure design that meets Alberta Agriculture standards and local code requirements demonstration of appropriate construction and fabrication skills. <p><i>Assessment Tool</i> <i>Project Assessment: Building an Agri-Structure, CON2100-1</i></p> <p><i>Standard</i> <i>The appropriate materials are selected and ordered. The structure should be accurately laid out, assembled and finished according to conventional building practices</i> <i>Performance rating of 2 for each applicable task</i></p>	<p>10</p> <p>20</p> <p>70</p>

MODULE CON2100: AGRI-STRUCTURES (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</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>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> Materials and Structures 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe the types of materials and structures used in agriculture businesses list the factors that affect the choice of materials and design of agri-structure such as: <ul style="list-style-type: none"> human and environmental safety standards animal comfort and safety crop protection conditions of use ease of construction and maintenance material cost. 	<p>This module provides students with the opportunity to apply basic construction principles and practices to farm-type buildings and structures.</p>
<p>Planning and Management</p> <ul style="list-style-type: none"> Structural Designs Estimating and Scheduling 	<ul style="list-style-type: none"> produce/select an agri-structure design that: <ul style="list-style-type: none"> uses two or more types of structural materials applies basic construction principles and processes meets industry standards estimate the cost of materials and prepare a work schedule. 	

MODULE CON2100: AGRI-STRUCTURES (continued)

Concept	Specific Learner Expectations	Notes
Implementation <ul style="list-style-type: none"><li data-bbox="207 453 386 520">• Material Processing	<i>The student should:</i> <ul style="list-style-type: none"><li data-bbox="487 453 1109 520">• use the appropriate tools materials and processes to construct and finish a structure.	
Assessment <ul style="list-style-type: none"><li data-bbox="207 625 386 693">• Career Preparation	<ul style="list-style-type: none"><li data-bbox="487 625 1122 693">• maintain a record of completed activities within a portfolio.	

MODULE CON2120: MULTIPLE MATERIALS

Level: Intermediate

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1120 Project Management

Module Description: Students develop a product that incorporates two or more types of material in its construction.

Module Parameters: Access to a fully equipped materials facility and to instruction from an individual with specialized training in the use of common materials and tools.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify advantages of using different materials in a product apply knowledge of structural materials, planning, and construction techniques to produce a product from different materials 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> knowledge of the properties of common structural materials and formulation of criteria for using unlike materials for a given application. <p><i>Assessment Tool</i> <i>Project Assessment: Products from Multiple Materials, CON2120-1</i></p> <p><i>Standard</i> <i>Presentation should include the identification of relevant properties and choice based on appearance, serviceability and cost of materials</i> <i>Performance rating of 2 for each applicable task</i></p>	10
	<ul style="list-style-type: none"> the demonstration of production skills to produce a product made from two or more different materials. <p><i>Assessment Tool</i> <i>Project Assessment: Products from Multiple Materials, CON2120-1</i></p> <p><i>Standard</i> <i>The project should be built using the appropriate materials, joinery and finishing techniques; all joints are to be tight fitting and square; finishes are to be smooth and free from production defects. Overall dimensions should be ± 2 mm</i> <i>Performance rating of 2 for each applicable task</i></p>	70
		20

MODULE CON2120: MULTIPLE MATERIALS (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</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>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> Material Characteristics Fastening and Finishing Systems Health and Safety 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe the properties of common production materials research and state the reasons for using combinations of wood, metal, plastic, ceramic and other materials identify the methods by which different materials are fastened together identify the types of finishes that are compatible with wood, metal, plastic, ceramic and other surfaces identify health and safety concerns associated with a given material. 	<p>Base reasons on:</p> <ul style="list-style-type: none"> appearance serviceability ease of construction strength cost etc. <p>Consider mechanical means as well as bonding agents.</p> <p>Refer to WHMIS Material Safety data sheets for appropriate handling use and storage of materials.</p>

MODULE CON2120: MULTIPLE MATERIALS (continued)

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> • Product Design • Work Scheduling 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • select, modify or design a product that incorporates two or more materials in its construction • select compatible finishes • create a cutting list and cost estimate • prepare a detailed sequence of operations that facilitates the safe and efficient use of materials and tools. 	
<p>Implementation</p> <ul style="list-style-type: none"> • Material Processing • Finishing 	<ul style="list-style-type: none"> • use the appropriate tools and supplies to safely: <ul style="list-style-type: none"> – measure and lay out components – cut and remove waste from materials – form components where required – fasten or bond components – align and clamp components – prepare for finishing • finish the product using appropriate finishes. 	
<p>Assessment</p> <ul style="list-style-type: none"> • Quality Control • Career Preparation 	<ul style="list-style-type: none"> • identify indicators of a quality product • maintain a record of completed activities within a portfolio. 	<p>Discuss issues related to appearance, serviceability, workmanship and cost-effectiveness.</p>

MODULE CON2130: FURNITURE MAKING 1 (BOX CONSTRUCTION)

Level: Intermediate

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1120 Project Management

Module Description: Students develop basic joinery skills and knowledge related to case construction, by producing a box-type piece of furniture.

Module Parameters: Access to a woodworking or materials facility and to instruction from an individual with formal, specialized training in cabinetry/carpentry.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">identify and describe the design features and processes used to construct a box-type furniture productapply basic furniture-making skills to plan and construct a piece of furniture based on box construction techniques	<i>Assessment of student achievement should be based on:</i> <ul style="list-style-type: none">analysis of an existing piece of furniture or drawing to correctly determine the:<ul style="list-style-type: none">materials used in surface and structural componentsjoints and fastenerstype of finishpotential weaknesses and points of wear	15
	<ul style="list-style-type: none">appropriate design/selection or modification of a box-type product that includes a set of working drawings, parts list, costs estimate, sequence of operations and work schedule	20
	<ul style="list-style-type: none">construction of a box-type furniture components or product. <p><i>Assessment Tool</i> <i>Project Assessment: Box Construction, CON2130-1</i></p> <p><i>Standard</i> <i>The product will be built using the appropriate materials, joinery and finishing techniques; joints are to be tight fitting, flush and square; finishes are to be smooth and free from production defects. Overall dimensions should be within ± 2 mm</i> <i>Performance rating of 2 for each applicable task</i></p>	65

MODULE CON2130: FURNITURE MAKING 1 (BOX CONSTRUCTION) (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</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>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> Box Construction Tool Safety Fittings 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> research typical design and joinery techniques that are commonly used in box construction identify additional construction features such as: <ul style="list-style-type: none"> door drawer plinth describe the safe set-up and operation of hand and/or power tools to make a series of joints; e.g.: <ul style="list-style-type: none"> reinforced butt reinforced miter rabbet dado finger identify and describe the use of common fasteners and clamping procedures used with a specific joint identify common fittings and construction techniques used to make: <ul style="list-style-type: none"> flush sliding tambour fall flap doors. 	<p>This module can be combined with subsequent modules to accommodate more elaborate features such as doors, drawers and a plinth.</p> <p>Review the safe use of the appropriate tools to make a specific joint, such as dado head, router, biscuit joiner.</p> <p>Identify recommended adhesives in relation to intended use and type of joint.</p>

MODULE CON2130: FURNITURE MAKING 1 (BOX CONSTRUCTION) (continued)

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> • Product Design • Estimating • Work Scheduling 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • select a box-type product that requires the use of: <ul style="list-style-type: none"> – solid wood and/or composites – a variety of joints and fasteners – typical lay-up and clamping procedures • prepare a material list and cost estimate from a working drawing • prepare a work schedule. 	<p>Suggest products such as:</p> <ul style="list-style-type: none"> • jewelry box • shelving unit • hope chest • speaker enclosure.
<p>Implementation</p> <ul style="list-style-type: none"> • Material Processing 	<ul style="list-style-type: none"> • use the appropriate tools, materials and processes to: <ul style="list-style-type: none"> – measure and lay out stock – cut stock to size – machine surfaces and joints – lay-up, glue, fasten and clamp – fill or plug exposed fasteners – prepare for finishing. 	<p>This project can be finished in conjunction with CON2150: Finishing & Refinishing.</p>
<p>Assessment</p> <ul style="list-style-type: none"> • Career Information • Career Preparation 	<ul style="list-style-type: none"> • identify the types of skills that are required of custom furniture builders • maintain a record of completed activities within a portfolio. 	<p>Discuss the need to be able to:</p> <ul style="list-style-type: none"> • read drawings • calculate and measure accurately • use effective planning and problem-solving strategies • use equipment and materials safely.

MODULE CON2140: FURNITURE MAKING 2 (FRAME & PANEL)**Level:** Intermediate**Theme:** Manufacturing Systems (Processes and Applications)**Prerequisite:** CON1120 Project Management**Module Description:** Students use solid and/or composite materials to build a frame and panel product or component.**Module Parameters:** Access to a woodworking or materials facility and to instruction from an individual with formal specialized training in cabinetry/carpentry.**Curriculum and Assessment Standards**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> identify and describe the design features and processes used to construct a frame and panel product apply basic furniture-making skills to plan and construct a component or piece of furniture based on frame and panel construction techniques 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> analysis of an existing piece of furniture or drawing to correctly determining the: <ul style="list-style-type: none"> materials used in surface and structural components joints and fasteners potential weakness and points of wear appropriate design selection, modification or creation of a frame and panel product or component that includes a set of drawings, parts list, cost estimate, sequence of operations and work schedule construction of a frame and panel product or component. <p><i>Assessment Tool</i> <i>Project Assessment: Frame and Panel Construction, CON2140-1</i></p> <p><i>Standard</i> <i>The project will be built using the appropriate materials, joinery and finishing techniques; all joints are to be tight fitting and square; finishes are to be smooth and free from production defects. Overall dimensions should be within ± 2 mm</i> <i>Performance rating of 2 for each applicable task</i></p>	<p>10</p> <p>20</p> <p>70</p>

MODULE CON2140: FURNITURE MAKING 2 (FRAME & PANEL) (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</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>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> Frame and Panel Construction Fastening Systems Tool Safety 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> identify the construction details of a typical frame and panel component identify the typical wood joints that are used in frame and panel construction identify and describe the types of fastening systems that are used in flat frame construction; e.g.: <ul style="list-style-type: none"> reinforcing plates dowelling biscuits splines describe the safe set-up and operation of hand and/or power tools used to make a series of joints; e.g.: <ul style="list-style-type: none"> mortise and tenon dowel biscuit lap miter loose tenon. 	<p>Point out the need to accommodate the movement of the panel within the frame.</p>

MODULE CON2140: FURNITURE MAKING 2 (FRAME & PANEL) (continued)

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> • Product Design • Work Scheduling 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • select a frame and panel product or component that requires: <ul style="list-style-type: none"> – interpretation and development of simple working drawings – use of solid woods and/or composites – use of a variety of wood joints, fasteners and other hardware components – typical lay-up and clamping procedures • show a detailed material list, cost estimate and work schedule. 	
<p>Implementation</p> <ul style="list-style-type: none"> • Material Processing 	<ul style="list-style-type: none"> • use the appropriate tools, machines and processes to: <ul style="list-style-type: none"> – measure and lay out stock – cut stock to size – machine and fit joints – lay-up, glue, fasten and/or clamp – fill or plug exposed fasteners (where applicable) – finish the project. 	<p>This project can be finished in conjunction with CON2150: Finishing & Refinishing.</p>
<p>Assessment</p> <ul style="list-style-type: none"> • Career Preparation 	<ul style="list-style-type: none"> • maintain a record of completed activities within a portfolio. 	

MODULE CON2150: FINISHING & REFINISHING

Level: Intermediate

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

Module Description: Students use knowledge of finishing materials and finishing techniques to apply new and replacement finishes.

Module Parameters: Access to a woodworking or materials facility and to instruction from an individual with specialized training in finishing/refinishing.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none">• identify common finishes and finishing/refinishing techniques• identify and describe the health hazards and Workplace Hazardous Materials Information System (WHMIS) regulations associated with the products used in finishing/refinishing• demonstrate appropriate finishing/refinishing techniques	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none">• a written or oral response that identifies common finishes and application techniques, health hazards associated with the handling and storage of finishing materials. <p><i>Assessment Tool</i> <i>Response Assessment: Common Finishes and Finishing Techniques, CON2150-1</i></p> <p><i>Standard</i> <i>Response rating of 2</i></p> <ul style="list-style-type: none">• application of finishing skills to finish/refinish a piece of furniture <p><i>Assessment Tool</i> <i>Activity Assessment: Product Finishing, CON2150-2</i></p> <p><i>Standard</i> <i>Finish should be applied according to the manufacturer's recommendations. Finished surfaces are consistent smooth, free of runs and dust particles</i> <i>Performance rating of 2 for each applicable task</i></p>	<p>20</p> <p>10</p> <p>70</p>

MODULE CON2150: FINISHING & REFINISHING (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</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>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> Refinishing Conditioning Finishes Sealers and Fillers 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe techniques that are used to: <ul style="list-style-type: none"> identify an existing finish remove a stain or finish prepare a surface for refinishing explain: <ul style="list-style-type: none"> bleaching and staining filling and sealing creating a distressed finish identify common finishes and applications explain the purpose of a filler and sealer identify the preferred method of applying each of the above finishes such as brush, roller, rag, spray gun describe what thinners and cleaners are used in conjunction with a given finish 	<p>Avoid working with finishes that contain lead.</p> <p>Discuss the use of:</p> <ul style="list-style-type: none"> oil shellac varnish lacquer urethane epoxy finishes. <p>Explain why it is important to use the appropriate finish remover and thinner.</p>

MODULE CON2150: FINISHING & REFINISHING (continued)

Concept	Specific Learner Expectations	Notes
<ul style="list-style-type: none"> • Health and Safety 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • describe the manufacturers' recommendations and WHMIS regulations that apply to the use and storage of a given product. 	<p>Students need to understand the purpose and use of product labels and material safety data sheets.</p>
<p>Planning and Management</p>	<ul style="list-style-type: none"> • for a refinishing project: <ul style="list-style-type: none"> – identify the nature of the existing finish and finish removers – identify appropriate personal protective equipment • for new and old surfaces: <ul style="list-style-type: none"> – select a suitable new or replacement finish – prepare a detailed set of step-by-step finishing procedures – clean the product and the work site. 	<p>Review the appropriate procedures for disposing of waste materials.</p>
<p>Implementation</p> <ul style="list-style-type: none"> • Finishing Processes • Safety 	<ul style="list-style-type: none"> • use the appropriate tools, materials and techniques to: <ul style="list-style-type: none"> – remove an existing finish – stain and seal – apply the necessary top coats – sand, rub and polish as required • discard all rags and used materials in the appropriate containers. 	<p>Point out the importance of working in a clean and well-ventilated work area.</p>
<p>Assessment</p> <ul style="list-style-type: none"> • Quality Control • Career Preparation 	<ul style="list-style-type: none"> • identify ways to improve the quality of a finish • maintain a record of completed activities within a portfolio. 	

MODULE CON2160: CABINETMAKING 1 (WEB & FACE FRAME)

Level: Intermediate

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1120 Project Management

Module Description: Students apply web and face frame construction techniques, and use solid and/or manufactured materials to produce a built-in or modular cabinet.

Module Parameters: Access to a woodworking or materials facility and to instruction from an individual with specialized training in cabinetry/carpentry.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none">• identify and describe the design features and processes used to construct a web and face frame product	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none">• analysis of a typical web and face frame product or drawing that correctly identifies and describes the types of:<ul style="list-style-type: none">– materials and finishes– joints and methods of fastening to a box structure– potential weaknesses and points of wear <p style="text-align: center;"><i>and</i></p> <ul style="list-style-type: none">• demonstration of appropriate estimating and event scheduling skills. <p><i>Assessment Tool</i> <i>Project Assessment: Web and Face Frame Construction, CON2160-1</i></p> <p><i>Standard</i> <i>Materials list is accurately determined using a working drawing, events are identified and scheduled in a safe and logical sequence of operations</i> <i>Performance rating of 2 for each applicable task</i></p>	<p>10</p> <p>15</p>

MODULE CON2160: CABINETMAKING 1 (WEB & FACE FRAME) (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> • build a cabinet using web and face frame construction techniques • demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> • application of web and face frame construction skills and techniques. <p><i>Assessment Tool</i> <i>Project Assessment: Web and Face Frame Construction, CON2160-1</i></p> <p><i>Standard</i> <i>The project should be built using the appropriate materials, joinery and finishing techniques. All joints are to be tight fitting, flush and square; finishes are to be smooth and free from production defects. Overall dimensions are within ± 2 mm</i></p> <p><i>Performance rating of 2 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>75</p> <p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> • Construction Methods • Tool Safety 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • describe the principal methods used to construct a built-in cabinet; e.g.: <ul style="list-style-type: none"> – on-site construction – modular system • identify the parts of a web frame cabinet • describe the types of joints used in web and face frame construction • describe safe set-up procedures to make common joints associated with web and face frame construction • identify the appropriate fastening systems used in economy and premium grade construction. 	<p>For more elaborate projects, this module can be combined with other cabinetry modules.</p> <p>Review the use of a table/radial arm saw and compound miter saw.</p> <p>Discuss procedures used to make dowel, biscuit and pocket holes.</p>

MODULE CON2160: CABINETMAKING 1 (WEB & FACE FRAME) (continued)

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> • Design • Work Scheduling 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • select or modify a cabinet drawing that uses web and face frame construction • create a work schedule • prepare a material cutting list. 	
<p>Implementation</p> <ul style="list-style-type: none"> • Material Processing 	<ul style="list-style-type: none"> • use the appropriate tools, materials and processes to: <ul style="list-style-type: none"> – measure and lay out materials – rough-out materials – machine joints and surfaces – assemble, glue, fasten and clamp – fill, scrape and sand. 	
<p>Assessment</p> <ul style="list-style-type: none"> • Career Information • Career Preparation 	<ul style="list-style-type: none"> • analyze and compare the differences between a production cabinetmaker and custom cabinetmaker • maintain a record of completed activities within a portfolio. 	

MODULE CON2170: CABINETMAKING 2 (DOOR & DRAWER)

Level:	Intermediate
Theme:	Manufacturing Systems (Processes and Applications)
Prerequisite:	CON1120 Project Management
Module Description:	Students use solid and composite materials to develop skills in building cabinet doors and drawers.

Module Parameters: Access to a woodworking or materials facility and to instruction from an individual with formal, specialized training in cabinetry/ carpentry.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">identify and describe common methods of designing and constructing cabinet doors and drawersapply cabinetmaking skills to plan and construct door/drawer components	<i>Assessment of student achievement should be based on:</i> <ul style="list-style-type: none">analysis of existing door and drawer products or drawings to determine:<ul style="list-style-type: none">the structural materialsthe parts of a typical door and drawertwo or more edge treatments used on a doortwo or more types of joints used in a drawer constructiontwo or more types of hinge and slide hardwarethe construction of a door and drawer product or component.	15
	<i>Assessment Tool</i> <i>Project Assessment: Door and Drawer Construction, CON2170-1</i> <i>Standard</i> <i>The project should be built using the appropriate materials, joinery and finishing techniques; all joints are to be tight fitting and square; finishes are to be smooth and free from production defects. Overall dimensions should be within ± 2 mm</i> <i>Performance rating of 2 for each applicable task</i>	75

MODULE CON2170: CABINET MAKING 2 (DOOR & DRAWER) (continued)

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> • Design • Work Scheduling 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • select or modify a cabinet drawing of a drawer and built-up door • select the appropriate door and dresser material • identify an appropriate door guiding system • create a material and procedural list. 	<p>Discuss the different quality levels of door and drawer construction and hardware.</p>
<p>Implementation</p> <ul style="list-style-type: none"> • Material Processing 	<ul style="list-style-type: none"> • use the appropriate tools, materials and processes to: <ul style="list-style-type: none"> – measure and lay out materials – machine surfaces and joints – assemble, glue, fasten and clamp – prepare for finishing. 	<p>Finishing may be completed in CON2150: Finishing & Refinishing.</p>
<p>Assessment</p> <ul style="list-style-type: none"> • Career Information • Career Preparation 	<ul style="list-style-type: none"> • identify specific employment and further training opportunities related to custom and factory-made cabinets • maintain a profile of completed activities within a portfolio. 	

MODULE CON2180: WOOD FORMING

Level: Intermediate

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1120 Project Management

Module Description: Students apply skills in mold making and wood conditioning to make a formed part or component.

Module Parameters: Access to a woodworking or materials facility and to instruction from an individual with specialized training in woodworking.

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none">describe common wood forming techniques	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none">a written or oral response that correctly identifies describes three wood forming techniques. <p><i>Assessment Tool</i> <i>Response Assessment, Bending and Laminating, CON2180-1</i></p> <p><i>Standard</i> <i>Response rating of 2</i></p>	10
<ul style="list-style-type: none">build or obtain the necessary molds and clamping devices to bend a piece of solid stock or wood laminate	<ul style="list-style-type: none">construction/set-up of tools required to bend a piece of solid or laminated stock. <p><i>Assessment Tool</i> <i>Product Assessment: Wood Formed Products, CON2180-2</i></p> <p><i>Standard</i> <i>Molds allow for even application of pressure and protect surface from unnecessary blemishes</i> <i>Performance rating of 2 for each applicable task</i></p>	20
<ul style="list-style-type: none">apply wood forming skills and techniques to make a product or component	<ul style="list-style-type: none">application of wood forming techniques and skills to create a product with one or more formed components. <p><i>Assessment Tool</i> <i>Project Assessment: Wood Formed Products, CON2180-2</i></p> <p><i>Standard</i> <i>The appropriate materials are selected and bent accurately so as to provide a tight fit to all adjoining components. An individual product is accurate to the original design</i> <i>Performance rating of 2 for each applicable task</i></p>	70

MODULE CON2180: WOOD FORMING (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</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>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> Forming Techniques Forming Materials 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> research and describe typical methods of bending solid stock and laminates; such as soaking in water, steaming or chemical conditioning describe how to determine the correct spacing for cross and parallel kerfing describe a system to moisten or steam wood (plasticize) prior to bending identify woods that lend themselves to cold water or steam bending identify methods of building up – molding and clamping veneer stock select the most appropriate adhesive for a given application and process. 	<p>Discuss the inherent dangers associated with the use of steam.</p>
<p>Planning and Management</p> <ul style="list-style-type: none"> Design Material 	<ul style="list-style-type: none"> select or design a formed product or component calculate the spacing of kerfs for a given radius bend design a mold for bending or contouring solid stock obtain suitable stock for bending. 	<p>Products might include:</p> <ul style="list-style-type: none"> furniture components recreational equipment marine structures.

MODULE CON2180: WOOD FORMING (continued)

Concept	Specific Learner Expectations	Notes
<p>Implementation</p> <ul style="list-style-type: none"> • Material Processing 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • use the appropriate tools, materials and processes to: <ul style="list-style-type: none"> – prepare solid and/or veneer stock for bending – condition, glue and secure – release and finish. 	<p>Discuss the importance of using stock that is free from knots and cross-grained sections.</p>
<p>Assessment</p> <ul style="list-style-type: none"> • Career Preparation 	<ul style="list-style-type: none"> • maintain a record of completed activities within a portfolio. 	

MODULE CON2190: MANUFACTURING SYSTEMS

Level:	Intermediate
Theme:	Manufacturing Systems (Processes and Applications)
Prerequisite:	None
Module Description:	Students investigate the nature of manufacturing systems used to produce durable goods.

Module Parameters: Access to in-school and community resources related to manufacturing.

Supporting Module: CON1010 Basic Tools & Materials

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> describe current production systems used to manufacture durable goods identify the lines of communication and decision making in a typical production system explain how the production of durable goods is being altered by the effects of technology and the global economy demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> the analysis of two systems of production currently in use and the presentation of a report that emphasizes the: <ul style="list-style-type: none"> advantages and disadvantages of each system lines of communication and decision making processes typical to each system how these systems are being altered to meet the needs of and competition in a global economy. <p><i>Assessment Tool</i> <i>Assessment Framework: Presentations/Reports, CONPRE</i></p> <p><i>Standard</i> <i>Performance rating of 2 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>100</p> <p>Integrated throughout</p>

MODULE CON2190: MANUFACTURING SYSTEMS (continued)

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> • History of Manufacturing • Economic Advantages • Organization 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • describe the development of modern manufacturing from its early routes in the domestic, cottage and factory systems • explain the advantages and disadvantages of a strong manufacturing base in a community • describe the operations of a typical manufacturing system's input requirements, types of processes and outputs as well as its feedback mechanisms • show how a typical manufacturer is able to: <ul style="list-style-type: none"> – increase productivity – provide for choice – reduce skill level requirements – reduce costs per unit produced • describe how computer-assisted manufacturing, just-in-time and total quality management systems increase: <ul style="list-style-type: none"> – productivity – quality – profitability • research a manufacturing company and describe its: <ul style="list-style-type: none"> – organizational structure – methods of decision making – methods of financing – training practices – research and development – marketing practices • explain why manufacturers are interested in locating near: <ul style="list-style-type: none"> – skilled population bases – resources – markets 	<p>This module is investigative in nature. Students should be encouraged to visit local manufacturers to obtain much of their information base.</p> <p>If possible, have students arrange an interview with a local manufacturer.</p>

MODULE CON2190: MANUFACTURING SYSTEMS (continued)

Concept	Specific Learner Expectations	Notes
<ul style="list-style-type: none">• Global Impact	<p><i>The student should:</i></p> <ul style="list-style-type: none">• describe the place organized labour has in manufacturing• explain how manufacturing is being altered by our global economy and the use of technology.	

MODULE CON2200: PRODUCT DEVELOPMENT

Level: Intermediate

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

Module Description: Students work, individually or as team members, to research, design and build a product suitable for mass production and marketing.

Module Parameters: Access to a materials/construction facility and to instruction from an individual with specialized training in the use of tools and materials.

Supporting Module: CON2190 Manufacturing Systems

Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none">list and describe the steps involved in developing a product for manufacturing	<i>Assessment of student achievement should be based on:</i> <ul style="list-style-type: none">presentation of a group or individually prepared report that list and describes the steps in developing a product for manufacturing, such as:<ul style="list-style-type: none">defining the problemresearch possible solutionscreating solutionsdetermining marketabilitydetermining profit margin	20
<ul style="list-style-type: none">apply designing and planning skills to assist in the development of a prototype	<ul style="list-style-type: none">demonstrate design and planning skills required in the development of a prototype product. <p><i>Assessment Tool</i> <i>Project Assessment: Building a Prototype, CON2200-1</i></p> <p><i>Standard</i> <i>Performance rating of 2 for each applicable task</i></p>	50
<ul style="list-style-type: none">describe the marketing and manufacturing potential of a product	<ul style="list-style-type: none">evaluation of a product prototype to determine whether it meets the desired design, production and marketing criteria. <p><i>Assessment Tool</i> <i>Illustrative Example, CON2200-2</i></p> <p><i>Standard</i> <i>Performance rating of 2 for each applicable task</i></p>	30

MODULE CON2200: PRODUCT DEVELOPMENT (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> demonstrate basic competencies. 	<p><i>Assessment of student achievement should be based on:</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>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> Product Life Cycle Idea Generation Testing 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> describe the life cycle of a typical product from the time of introduction to its decline identify reasons for a product being successful; e.g.: <ul style="list-style-type: none"> meet a physical and emotional need marketing practice pricing reputation explain how new product ideas are generated outline how ideas are developed into new products identify the major steps involved in engineering a new product state the importance of product testing and market surveys. 	<p>Note the importance of considering the issues related to product disposal and/or recycling in the initial design stages of a product.</p> <p>Students should be encouraged to create a new product, not simply replicate an existing one.</p>

MODULE CON2200: PRODUCT DEVELOPMENT (continued)

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> • Prototype Development 	<p><i>The student should:</i></p> <ul style="list-style-type: none"> • select or design a product for manufacturing • create the necessary detail, assembly and schematic drawings • identify the appropriate materials • create a prototype product • analyze the design: <ul style="list-style-type: none"> – function – aesthetic appeal – reliability – manufacturability – profitability • create a market survey. 	
<p>Implementation</p>	<ul style="list-style-type: none"> • create a prototype product • test the product • prepare a market survey. 	
<p>Assessment</p> <ul style="list-style-type: none"> • Career Assessment • Career Preparation 	<ul style="list-style-type: none"> • identify career opportunities related to product marketing and research • maintain a record of completed activities within a portfolio. 	

