

## MODULE CURRICULUM AND ASSESSMENT STANDARDS:

### SECTION F: ADVANCED LEVEL

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

Advanced level modules demand a higher level of expertise and help prepare students for entry into the workplace or a related post-secondary program.

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## MODULE CON3010: CONCRETE WORK (STRUCTURES & FINISHES)

**Level:** Advanced

**Theme:** Building Systems (Processes and Applications)

**Prerequisite:** CON1070 Building Construction

**Module Description:** Students develop essential skills to form, place and finish a concrete project.

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

**Supporting Modules:** CON2010 Site Preparation  
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"> <li>identify and describe concrete forming, placing and finishing techniques</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>a written report or display that accurately represents accepted forming, placing and finishing trade practices.</li> </ul> <p><i>Assessment Tool</i> <i>Research Process: Concrete Forming, Placing and Finishing, CON3010-1</i></p> <p><i>Standard</i> <i>Performance rating of 3 for each applicable task</i></p>	20
<ul style="list-style-type: none"> <li>use the appropriate tools, materials and processes to form, reinforce, place and finish a concrete structure</li> </ul>	<ul style="list-style-type: none"> <li>demonstration of concrete forming, placing and finishing techniques.</li> </ul> <p><i>Assessment Tool</i> <i>Assessment Framework: Activity Assessment, CONACT</i></p> <p><i>Standard</i> <i>The project should be free of voids and finished in a manner appropriate to its application</i> <i>Performance rating of 3 for each applicable task</i></p>	65
<ul style="list-style-type: none"> <li>create a profile of a trade or occupation within the field of concrete work</li> </ul>	<ul style="list-style-type: none"> <li>presentation of an occupational profile that includes a description of working conditions, employment and training opportunities related to concrete work.</li> </ul> <p><i>Assessment Tool</i> <i>Research Process: Concrete Forming, Placing and Finishing, CON3010-1</i></p> <p><i>Standard</i> <i>Performance rating of 3 for each applicable task</i></p>	15

**MODULE CON3010: CONCRETE WORK (STRUCTURES & FINISHES) (continued)**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>Concrete Mixing and Testing</li> <li>Forming</li> <li>Placement and Finishing</li> <li>Fasteners</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>research the effect aggregate, water and cement ratios have on the workability and quality of a concrete mix</li> <li>list and describe the purpose of different cement types</li> <li>identify the types of tests and reasons for concrete testing</li> <li>describe standard forming and reinforcing practices for a project; e.g.:                             <ul style="list-style-type: none"> <li>slab on grade</li> <li>retaining wall</li> <li>poured stairs</li> </ul> </li> <li>explain the purpose of a control and expansion joint in a concrete structure</li> <li>identify the purpose and describe the process of:                             <ul style="list-style-type: none"> <li>screeding</li> <li>puddling</li> <li>striking off</li> <li>floating</li> <li>troweling</li> <li>finishing</li> <li>curing</li> </ul> </li> <li>describe common methods of installing fasteners in concrete before and after the concrete has set up and cured</li> </ul>	<p>Emphasize the importance of using clean aggregate and water.</p> <p>Demonstrate the slump test and describe compression testing.</p> <p>Explain why rebar should be free of loose rust, scale grease and other foreign matter.</p> <p>Identify required protection of rebar exposed to the weather or ground.</p>

**MODULE CON3010: CONCRETE WORK (STRUCTURES & FINISHES) (continued)**

Concept	Specific Learner Expectations	Notes
<ul style="list-style-type: none"> <li>• Tool Safety</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• describe the safe use and storage of explosive actuated tools and supplies</li> <li>• identify power loads and strengths for a given application</li> <li>• describe prefiring and firing routines.</li> </ul>	<p>Students need to recognize the training requirements and the hazards associated with explosive actuated tools.</p>
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Material and Work Scheduling</li> </ul>	<ul style="list-style-type: none"> <li>• select a concrete project that requires:               <ul style="list-style-type: none"> <li>– forming</li> <li>– reinforcement</li> <li>– consolidation and finishing</li> </ul> </li> <li>• produce a list of materials and schedule of events for an on-site project.</li> </ul>	<p>A typical shop project may include sidewalk blocks, truck weights, sundial or birdbath.</p> <p>On-site projects could include slab on grade, steps or retaining wall.</p>
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Material Processing</li> </ul>	<ul style="list-style-type: none"> <li>• use the appropriate tools, materials and processes to:               <ul style="list-style-type: none"> <li>– prepare the grade and base</li> <li>– assemble/build and condition a form</li> <li>– install damp-proof member</li> <li>– fabricate and install the required reinforcement</li> <li>– mix/order, place and consolidate</li> <li>– impart desired finish/colour</li> <li>– provide proper curing conditions</li> <li>– remove forms.</li> </ul> </li> </ul>	<p>Discuss the type of finishes and colours that can be obtained on a concrete surface.</p>
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• identify the employment and training opportunities related to:               <ul style="list-style-type: none"> <li>– product distribution</li> <li>– concrete testing</li> <li>– engineering</li> <li>– concrete placing and finishing</li> </ul> </li> <li>• assess personal interests and abilities related to making realistic career choices</li> <li>• maintain a record of completed work within a portfolio.</li> </ul>	<p>Students need to be aware that because concrete is used extensively in residential, commercial and civil construction, it provides a large number of career opportunities.</p>



**MODULE CON3020: MASONRY WORK (STRUCTURES & FINISHES)****Level:** Advanced**Theme:** Building Systems (Processes and Applications)**Prerequisite:** CON1070 Building Construction**Module Description:** Students develop basic knowledge and skills related to masonry materials, structures and finishes.**Module Parameters:** Access to a building site and/or construction facility and to instruction from an individual with specialized training in masonry work.**Supporting Module:** CON3010 Concrete Work (Structures & Finishes)**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"> <li>identify and describe common types of masonry materials and finishes</li> <li>read and interpret a working drawing to prepare a cost estimate of a masonry surface</li> <li>apply masonry skills to assist in the application of a masonry finish or in the construction of a masonry structure</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>written response that correctly identifies and describes three different masonry materials and finishes.</li> </ul> <p><i>Assessment Tool</i> <i>Research Process: Masonry Materials and Finishes, CON3020-1</i></p> <p><i>Standard</i> <i>Performance rating of 3 for each applicable task</i></p>	10
	<ul style="list-style-type: none"> <li>preparation of a cost estimate that includes cost of materials and labour</li> </ul>	15
	<ul style="list-style-type: none"> <li>demonstration of acceptable works skills in relation to the application of a masonry finishes or construction of a masonry structure.</li> </ul> <p><i>Assessment Tool</i> <i>Assessment Framework: Activity Assessment, CONACT</i></p> <p><i>Standard</i> <i>Finishes are applied and structure built in keeping with accepted trade practice</i> <i>Performance rating of 3 for each applicable task</i></p>	65



**MODULE CON3020: MASONRY WORK (STRUCTURES & FINISHES) (continued)**

Concept	Specific Learner Expectations	Notes
<ul style="list-style-type: none"> <li>• Brick Veneering (continued)</li>   <li>• Stuccoing</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• list and describe the basic tools that are used in laying brick and concrete blocks</li> <li>• describe the techniques that are used to:               <ul style="list-style-type: none"> <li>– cut brick</li> <li>– keep courses level and plumb</li> <li>– build a lead</li> <li>– tool joints</li> </ul> </li> <li>• examine a stucco wall section and identify the:               <ul style="list-style-type: none"> <li>– moisture barrier</li> <li>– corner and stop beads</li> <li>– lath or wire</li> <li>– scratch coat</li> <li>– screeds</li> <li>– finish coat</li> </ul> </li> <li>• identify common finishes and methods of application such as:               <ul style="list-style-type: none"> <li>– smooth</li> <li>– spatter</li> <li>– old English</li> </ul> </li> <li>• identify the differences and similarities between applying a stucco finish to a frame wall and applying parging to a cement or block wall</li> <li>• describe the steps that are taken to compensate for extreme weather conditions.</li> </ul>	<p>If possible, have students visit a building site to observe how bricks are laid.</p>
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Mixing Proportions</li> <li>• Estimating</li> </ul>	<ul style="list-style-type: none"> <li>• describe the proper mixing proportions to prepare a mortar, stucco and parging mix</li> <li>• estimate the amount of materials required to brick veneer a wall section, stucco or parge a surface.</li> </ul>	

**MODULE CON3020: MASONRY WORK (STRUCTURES & FINISHES) (continued)**

Concept	Specific Learner Expectations	Notes
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Material and Tool Processes</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• use appropriate materials, tools and techniques to:                             <ul style="list-style-type: none"> <li>– apply a brick veneer finish or build a brick structure</li> <li>– stucco or parge a wall surface.</li> </ul> </li> </ul>	<p>Students can gain experience laying brick using a non-permanent mortar.</p>
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• identify specialized training and skills required in the masonry trades</li> <li>• research the job opportunities, working conditions and wages paid to masonry workers</li> <li>• analyze personal interests and abilities related to making realistic career choices</li> <li>• maintain a record of completed activities within a portfolio.</li> </ul>	

## MODULE CON3030: WALL & CEILING FINISHING

**Level:** Advanced

**Theme:** Building Systems (Processes and Applications)

**Prerequisite:** CON1070 Building Construction

**Module Description:** Students develop basic knowledge and skills to insulate, install and finish an interior wall/ceiling surface.

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

**Supporting Module:** CON2040 Framing Systems 1 (Floor & Wall)

### 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"> <li>describe the procedures related to the installation of insulation and vapour barrier to an exterior wall and ceiling</li> <li>identify and describe the health hazards and safety precautions associated with the use of insulating, drywalling and finishing materials</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>a written response that correctly describes the procedures employed in the selection and installation of insulation, vapour barrier and wall/ceiling boards</li> <li>the identification of health and safety issues related to the handling and use of insulation and wallboard materials.</li> </ul> <p><i>Assessment Tool</i>  <i>Response Assessment: Insulating and Drywalling, CON3030–1</i></p> <p><i>Standard</i>  <i>Response rating of 3</i></p>	25
<ul style="list-style-type: none"> <li>prepare, apply and finish a wall and ceiling surface</li> </ul>	<ul style="list-style-type: none"> <li>demonstration of appropriate skills and techniques in the application of a wall/ceiling treatment given an on-site or mock-up project.</li> </ul> <p><i>Assessment Tool</i>  <i>Activity Assessment: Installing and Finishing Drywall, CON3030–2</i></p> <p><i>Standard</i>  <i>Materials have been selected and installed in keeping with the specifications, accepted trade practice and local code requirements.</i>  <i>Surfaces are finished smooth and free of voids</i>  <i>Performance rating of 3 for each applicable task</i></p>	75

**MODULE CON3030: WALL & CEILING FINISHING** (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>Materials</li> <li>Material Application</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>list and describe the types of wall and ceiling insulation and soundproofing materials</li> <li>describe the different types of drywall and conditions of use</li> <li>identify the building codes that relate to the installation of insulation, vapour barrier and drywall</li> <li>identify and describe the different types of tapes, corner beads, adhesives and fastening devices used with gypsum board</li> <li>describe methods of cutting, attaching, taping, filling, sanding and texturing a gypsum board</li> <li>describe methods of making repairs to small and large holes in a drywall surface</li> <li>identify the materials used to paint and decorate a wall surface</li> <li>research common methods used to apply paint to a surface; e.g.,               <ul style="list-style-type: none"> <li>brush</li> <li>roller</li> <li>spray.</li> </ul> </li> </ul>	<p>Not only does insulation reduce heat loss, it also can retard the spread of sound and fire.</p> <p>Avoid fillers that contain asbestos and paints that contain lead.</p>

**MODULE CON3030: WALL & CEILING FINISHING (continued)**

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Estimating</li> <li>• Pre-installation Processes</li> <li>• Health and Safety</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• estimate the amount and type of drywall, insulation, vapour barrier, paint and decorating supplies required to install and finish a wall or ceiling surface</li> <li>• check alignment of studs and identify starting points</li> <li>• mark stud locations on floor and ceiling</li> <li>• install metal protectors for wiring and plumbing where necessary</li> <li>• identify and locate appropriate personal protective equipment.</li> </ul>	<p>Students should be aware of the regulations regarding the transportation of dangerous goods and the use of hazardous materials.</p> <p>Refer to Materials Safety Data Sheets (MSDS) when using hazardous finishing and decorating supplies.</p>
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Material Processing</li> </ul>	<ul style="list-style-type: none"> <li>• use the appropriate tools, materials and processes to:               <ul style="list-style-type: none"> <li>– install insulation, vapour barrier and gypsum board</li> <li>– tape, fill, sand, texture, paint as required</li> <li>– repair a gypsum board surface</li> <li>– seal, paint and/or apply a wall covering.</li> </ul> </li> </ul>	<p>If on-site work is unavailable, consider using a mock-up project.</p> <p>Stress the importance of using the proper personal protective equipment.</p>
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• describe the working conditions and skills required of a drywall mechanic and/or painter/ decorator</li> <li>• maintain a record of completed activities within a portfolio.</li> </ul>	



## MODULE CON3040: STAIR CONSTRUCTION

**Level:** Advanced

**Theme:** Building Systems (Processes and Applications)

**Prerequisite:** CON1070 Building Construction

**Module Description:** Students develop the knowledge and skills required to build a straight flight of stairs.

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

**Supporting Module:** CON2040 Framing Systems 1 (Floor & Wall)

### Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none"><li>• identify and describe different stair types, component parts and construction techniques</li><li>• interpret building code regulations pertaining to residential stair design</li></ul>	<i>Assessment of student achievement should be based on:</i> <ul style="list-style-type: none"><li>• presentation of a written research project that identifies and describes four different stair and stringer types</li><li>• completion of a “Spec Sheet” that outlines the code requirements pertaining to a specific stair application.</li></ul> <i>Assessment Tool</i> <i>Research Process: Stair Construction, CON3040–1</i> <i>Standard</i> <i>The specifications should accurately address the allowable type and size of nosing, the amount of head room and unit rise and run</i> <i>Performance rating of 3 for each applicable task</i>	15  15



**MODULE CON3040: STAIR CONSTRUCTION** (continued)

Concept	Specific Learner Expectations	Notes
<ul style="list-style-type: none"> <li>• Stair and Rail Construction (continued)</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• describe the specific building code regulations regarding headroom, rise, run and railing specifications</li> <li>• identify a typical layout procedure for a wooden stringer</li> <li>• research methods of attaching and finishing treads and risers; e.g.:               <ul style="list-style-type: none"> <li>– housed</li> <li>– semi-housed</li> <li>– built-up stringer</li> <li>– notched stringer.</li> </ul> </li> </ul>	<p>Refer to local building codes.</p> <p>Explain the advantages and disadvantages of the various stair designs from the point of view of cost, ease of construction and strength.</p>
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Print Reading</li> <li>• Estimating</li> </ul>	<ul style="list-style-type: none"> <li>• read and interpret a drawing to determine the:               <ul style="list-style-type: none"> <li>– number of runs and risers</li> <li>– stair width</li> <li>– tread, riser and stringer dimensions</li> <li>– joints</li> <li>– types of materials and fasteners</li> <li>– guard and railing requirements</li> </ul> </li> <li>• prepare a detailed material list and cost estimate.</li> </ul>	
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Material Processing</li> </ul>	<ul style="list-style-type: none"> <li>• use the appropriate tools, materials and processes to:               <ul style="list-style-type: none"> <li>– prefabricate a set of stairs</li> <li>– install a suitable railing</li> <li>– check for code conformity.</li> </ul> </li> </ul>	
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• research business and career opportunities related to prefabricated stair construction and installation</li> <li>• maintain a record of completed activities within a portfolio.</li> </ul>	



## MODULE CON3050: ROOF STRUCTURES 2 (FRAMING & COVERING)

**Level:** Advanced

**Theme:** Building Systems (Processes and Applications)

**Prerequisite:** CON2050 Roof Structures 1 (Framing & Finishing)

**Module Description:** Students develop basic competencies in laying out, cutting and assembling common and hip and valley rafters in relation to specialized structures and coverings.

**Module Parameters:** Access to a building site and/or construction facility and to instruction from an individual with formal, 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"> <li>identify and describe the design features of intersecting sloped roofs</li> <li>calculate the length of rafters, using ratio and proportion techniques</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>presentation of a written research project that identifies and graphically illustrates the design features and components of an intersecting roof</li> <li>accurate calculations related to the layout of common, hip, valley and jack rafters.</li> </ul> <p><i>Assessment Tool</i> <i>Research Process: Rafter Construction, CON3050-1</i></p> <p><i>Standard</i> <i>Line length should be calculated to the nearest mm</i> <i>Performance rating of 3 for each applicable task</i></p>	<p>20</p> <p>20</p>
<ul style="list-style-type: none"> <li>lay out, cut and assemble a set of rafters for a roof assembly</li> </ul>	<ul style="list-style-type: none"> <li>application of layout, cutting and assembly skills to make at least one common, one hip or valley and two accompanying jack rafters.</li> </ul> <p><i>Assessment Tool</i> <i>Activity Assessment: Rafter Cutting and Assembly, CON3050-2</i></p> <p><i>Standard</i> <i>Rafters are shortened appropriately and cut to <math>\pm 3</math> mm of the correct length. Angles are within <math>\pm 1^\circ</math> and adjoining surfaces are tight fitting</i> <i>Performance rating of 3 for each applicable task</i></p>	<p>60</p>

**MODULE CON3050: ROOF STRUCTURES 2 (FRAMING & COVERING) (continued)**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tools</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"> <li>Roof Types and Design Features</li> <li>Roofing Materials</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>describe roof types and terminology</li> <li>explain how roof slopes are described and calculated</li> <li>explain the purpose of a roof overhang</li> <li>explain how roof dormers and Dutch gables are built</li> <li>describe three methods of determining the length of a common rafter</li> <li>describe the types of cuts and features of a:               <ul style="list-style-type: none"> <li>common rafter</li> <li>hip and valley rafter</li> <li>hip and valley jack rafter</li> </ul> </li> <li>investigate and describe alternate roof coverings such as:               <ul style="list-style-type: none"> <li>wood shakes</li> <li>metal shingle</li> <li>clay tiles.</li> </ul> </li> </ul>	<p>Students should note that flatter roofs require greater overhang to provide protection from the direct rays of the sun.</p> <p>Have students see how the Pythagorean Theorem can be applied to roof framing.</p>

**MODULE CON3050: ROOF STRUCTURES 2 (FRAMING & COVERING) (continued)**

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Roof Calculations</li> <li>• Work Scheduling</li> <li>• Worker Safety</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• from a set of drawings and specifications, calculate the:               <ul style="list-style-type: none"> <li>– roof slope</li> <li>– amount of overhang</li> <li>– length of hip, valley and related jack rafters</li> </ul> </li> <li>• sketch a rafter plan for a hip and valley roof system</li> <li>• estimate the cost of at least one alternate roof covering</li> <li>• create a work schedule and materials list</li> <li>• lay out a rafter pattern for a given slope and type of rafter</li> <li>• prepare and check the condition of required ladders and scaffolding.</li> </ul>	<p>Demonstrate how a framing square can be used to determine lengths of rafters and rafter cuts.</p> <p>Students should develop and use the slope gain factor.</p>
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Material Processing</li> </ul>	<ul style="list-style-type: none"> <li>• for a given roof section use the appropriate tools, materials and techniques to:               <ul style="list-style-type: none"> <li>– lay out the required patterns</li> <li>– cut the appropriate rafters to size</li> <li>– assemble and fasten</li> <li>– sheath and apply a sample of one or more alternate roof coverings.</li> </ul> </li> </ul>	
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• identify the skills required to be a successful roof framer and finisher</li> <li>• maintain a record of completed activities within a portfolio.</li> </ul>	



## MODULE CON3060: DOORS & TRIM

**Level:** Advanced

**Theme:** Building Systems (Processes and Applications)

**Prerequisite:** CON1070 Building Construction

**Module Description:** Students apply basic finish carpentry knowledge and skills to install doors, railings and moldings.

**Module Parameters:** Access to a building site and/or construction facility and to instruction from an individual with formal, 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"><li>identify common types of doors, hardware and trim products</li></ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"><li>presentation of a written research project that correctly identifies the common types and sizes of sliding, folding and swing doors; related hardware and trim products.</li></ul> <p><i>Assessment Tool</i> <i>Research Process: Installing Interior Doors and Trim, CON3060-1</i></p> <p><i>Standard</i> <i>Performance rating of 3 for each applicable task</i></p>	20
<ul style="list-style-type: none"><li>install doors, moldings and other trim products</li></ul>	<ul style="list-style-type: none"><li>installation of at least one door type and trim product.</li></ul> <p><i>Assessment Tool</i> <i>Assessment Framework: Activity Assessment, CONACT</i></p> <p><i>Standard</i> <i>The door frame should be plumb, appropriately secured and cased. The door should operate smoothly and trim products applied according to accepted trade practices</i> <i>Performance rating of 3 for each applicable task</i></p>	70



**MODULE CON3060: DOORS & TRIM (continued)**

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Estimating</li> <li>• Prefinishing</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• from a set of drawings:               <ul style="list-style-type: none"> <li>– identify the styles of moldings and calculate the amounts to be ordered to finish a wall section complete with door</li> <li>– prefinish moldings and casing where possible.</li> </ul> </li> </ul>	
<p>Implementation</p>	<ul style="list-style-type: none"> <li>• use the appropriate tools, materials and processes to:               <ul style="list-style-type: none"> <li>– install prefabricated door or bifold unit</li> <li>– install a lock set</li> <li>– install room moldings and casings.</li> </ul> </li> </ul>	
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• identify employment and training opportunities related to finish carpentry</li> <li>• describe personal interests and abilities related to making realistic career choices</li> <li>• maintain a record of completed activities within a portfolio.</li> </ul>	



## MODULE CON3070: FLOORCOVERING

**Level:** Advanced

**Theme:** Building Systems (Processes and Applications)

**Prerequisite:** CON1070 Building Construction

**Module Description:** Students develop skills in selecting and installing typical floor coverings used in residential, institutional and commercial buildings.

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

### 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"> <li>identify and describe common types of residential, institutional and commercial floor coverings</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>presentation of a written research project that identifies and describes four major floor types (resilient sheet or tile, wood, ceramic and carpet).</li> </ul> <p><i>Assessment Tool</i> <i>Research Process: Installing Floor Coverings, CON3070-1</i></p> <p><i>Standard</i> <i>Performance rating of 3 for each applicable task</i></p>	30
<ul style="list-style-type: none"> <li>apply flooring skills to assist in the installation of a floor covering</li> </ul>	<ul style="list-style-type: none"> <li>demonstration of appropriate skills in the application of one or more flooring materials given an on-site or mock-up project.</li> </ul> <p><i>Assessment Tool</i> <i>Assessment Framework: Activity Assessment, CONACT</i></p> <p><i>Standard</i> <i>Materials have been selected and installed in keeping with the manufacturer's recommendations and accepted trade practice. Joints are tight and patterns are aligned accurately; surfaces are smooth and free from blemishes</i> <i>Performance rating of 3 for each applicable task</i></p>	60



**MODULE CON3070: FLOORCOVERING (continued)**

Concept	Specific Learner Expectations	Notes
<ul style="list-style-type: none"> <li>• Installation Techniques</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• describe the processes used to:               <ul style="list-style-type: none"> <li>– rough fit, seam and stretch a carpet</li> <li>– rough fit and seam a vinyl covering</li> <li>– lay out a floor surface for tile, parquet and wood flooring</li> <li>– nail square edge and tongue-and-groove wood flooring</li> <li>– fill, sand and finish a wood floor</li> <li>– set, grout and seal ceramic tile.</li> </ul> </li> </ul>	<p>Discuss the issues related to removing an old floor covering and replacing it with a new one.</p>
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Estimating</li> </ul>	<ul style="list-style-type: none"> <li>• describe the appropriate flooring for a given application</li> <li>• calculate the cost of materials and supplies for a given area</li> <li>• measure an area and prepare a layout sketch of starter courses.</li> </ul>	<p>If on-site work is unavailable, consider using a mock-up activity.</p>
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Material Processing</li> </ul>	<ul style="list-style-type: none"> <li>• use the appropriate tools, materials and processes to:               <ul style="list-style-type: none"> <li>– prepare a floor surface</li> <li>– install a floor covering</li> <li>– seal and finish where applicable.</li> </ul> </li> </ul>	
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• identify the employment and business opportunities related to the manufacture, installation and sale of floor coverings</li> <li>• describe personal interests and abilities related to making realistic career choices</li> <li>• maintain a record of completed activities within a portfolio.</li> </ul>	



## MODULE CON3080: ENERGY-EFFICIENT HOUSING

**Level:** Advanced

**Theme:** Building Systems (Processes and Applications)

**Prerequisite:** CON1070 Building Construction

**Module Description:** Students investigate construction practices and support systems to create an energy-efficient housing design.

**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"> <li>identify and describe energy-efficient construction materials and techniques</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>a written report that correctly identifies and describes at least five types of energy efficient construction techniques and at least five energy efficient materials used in construction.</li> </ul> <p><i>Assessment Tool</i> <i>Assessment Framework: Presentations/Reports, CTSPRE</i></p> <p><i>Standard</i> <i>Performance rating of 3 for each applicable task</i></p>	20
<ul style="list-style-type: none"> <li>calculate the energy efficiency of a typical residence or commercial structure</li> </ul>	<ul style="list-style-type: none"> <li>the use of the appropriate programs to analyze and calculate the energy efficiency of a given house design</li> </ul>	30
<ul style="list-style-type: none"> <li>write a proposal outlining how to improve the energy efficiency of a given building</li> </ul>	<ul style="list-style-type: none"> <li>given the energy efficiency of a given building and knowledge of thermal resistance values of building materials, identifying at least five areas where the efficiency of a given building can be improved and the recommended procedures.</li> </ul> <p><i>Assessment Tool</i> <i>Assessment Framework: Research Process, CTSRES</i></p> <p><i>Standard</i> <i>Performance rating of 3 for each applicable task</i></p>	50

**MODULE CON3080: ENERGY-EFFICIENT HOUSING (continued)**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>identify the factors that have contributed to more energy efficient housing</li> <li>describe the construction techniques that are used in energy efficient buildings</li> <li>list and describe the materials that are used to improve the energy efficiency of a building</li> <li>define the term R factor</li> <li>describe the ways heat can enter or escape from a building</li> <li>describe corrective measures that can be undertaken in existing buildings to improve energy efficiency</li> <li>identify and describe passive and active heating and cooling systems</li> <li>research the effects of landscaping on the energy efficiency.</li> </ul>	
<p>Implementation</p>	<ul style="list-style-type: none"> <li>analyze an existing structure to estimate the heat loss through ceilings, walls, doors and windows</li> <li>prepare a proposal for an existing building outlining the work to be done to improve efficiency and its cost-effectiveness.</li> </ul>	<p>If possible, use a computer program to assist with the calculations.</p>

**MODULE CON3080: ENERGY-EFFICIENT HOUSING (continued)**

Concept	Specific Learner Expectations	Notes
Assessment <ul style="list-style-type: none"><li>• Career Information</li><li>• Career Preparation</li></ul>	<i>The student should:</i> <ul style="list-style-type: none"><li>• identify the employment and business opportunities related energy efficient research and design</li><li>• maintain a record of completed activities within a portfolio.</li></ul>	



## MODULE CON3090: RENOVATIONS/RESTORATIONS

**Level:** Advanced

**Theme:** Building Systems (Processes and Applications)

**Prerequisite:** CON1070 Building Construction

**Module Description:** Students work with a client to plan and complete a building renovation and/or restoration.

**Module Parameters:** Access to a building site and/or construction facility and to instruction from an individual with formal, 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"> <li>complete a feasibility study and cost estimate of a renovation/restoration project</li> <li>apply construction skills to assist in a building renovation/restoration project, using traditional and modern construction materials and techniques</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>analysis of an existing building to determine the feasibility and cost of undertaking a given renovation and/or restoration project.</li> </ul> <p><i>Assessment Tool</i> <i>Presentations/Reports: Building Renovation/Restoration Project, CON3090-1</i></p> <p><i>Standard</i> <i>The study will include an accurate description of the project and structural details, materials list, and time and cost estimate</i> <i>Performance rating of 3 for each applicable task</i></p>	30
	<ul style="list-style-type: none"> <li>demonstration of appropriate planning, management, construction and teamwork skills to complete a building renovation/restoration project.</li> </ul> <p><i>Assessment Tool</i> <i>Assessment Framework: Activity Assessment, CONACT</i></p> <p><i>Standard</i> <i>The renovation/restoration conforms to all local building codes and trade practices as well as meeting the client's expectations</i> <i>Performance rating of 3 for each applicable task</i></p>	70

**MODULE CON3090: RENOVATIONS/RESTORATIONS** (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>Renovation Practices</li> <li>Health and Safety</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>identify the types of renovations that are most commonly carried out such as:               <ul style="list-style-type: none"> <li>changing or adding windows</li> <li>creating a new entrance or opening a room</li> <li>building on an addition</li> <li>replacing exterior finish</li> </ul> </li> <li>identify what types of renovations require local permits or work that requires special skills and certification</li> <li>predict, by considering the age of the original building, the types of materials and construction techniques used in the original construction</li> <li>identify sources of information regarding construction methods and materials used in historical buildings</li> <li>list the materials that for health reasons require special care when renovating</li> <li>identify local regulations regarding the disposal of hazardous materials.</li> </ul>	<p>Besides new construction, students should be aware of the many opportunities for work related to building renovation and restoration.</p> <p>Pay special attention to asbestos and lead paint that may have been used in older buildings.</p>

**MODULE CON3090: RENOVATIONS/RESTORATIONS (continued)**

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Renovation Proposal</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• prepare a feasibility study by determining:               <ul style="list-style-type: none"> <li>– usefulness of the renovation</li> <li>– cost of materials and labour</li> <li>– disruption to the use of other living space</li> <li>– structural as well as aesthetic considerations</li> <li>– impact on support systems such as heating, lighting and plumbing</li> </ul> </li> <li>• prepare a working drawing of a typical renovation</li> <li>• prepare a work schedule for a typical renovation/restoration project.</li> </ul>	<p>Students should be aware that local planning authorities often will have a say in what can or cannot be done to a building particularly if it is considered to be a “Heritage Building.”</p>
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Construction Process</li> </ul>	<ul style="list-style-type: none"> <li>• apply planning, management and construction skills to complete a renovation and/or restoration project.</li> </ul>	
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• identify the employment opportunities and the establishment of an entrepreneurial venture associated with renovation work</li> <li>• maintain a record of completed activities within a portfolio.</li> </ul>	



## MODULE CON3100: COMMERCIAL STRUCTURES

**Level:** Advanced

**Theme:** Building Systems (Processes and Applications)

**Prerequisite:** CON1070 Building Construction

**Module Description:** Students investigate structural designs, construction techniques and work-site practices related to commercial construction.

**Module Parameters:** Access to a commercial construction site and/or construction facility and to instruction from an individual with formal, 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"> <li>compare the differences between residential, institutional and commercial construction</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>presentation of a written report that compares residential, institutional and commercial construction on the basis of: <ul style="list-style-type: none"> <li>the intended use</li> <li>the nature of specifications and codes</li> <li>types of foundations and superstructures</li> <li>job site organization</li> <li>specialized skills and trade requirements.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>Assessment Framework: Presentations/Reports, CTSPRE</i></p> <p><i>Standard</i>  <i>Performance rating of 3 for each applicable task</i></p>	20
<ul style="list-style-type: none"> <li>describe common types of materials and construction techniques used in commercial construction</li> </ul>	<ul style="list-style-type: none"> <li>incorporation of common materials and construction techniques used in a model or in photographs and diagrams of a commercial/institutional construction project.</li> </ul> <p><i>Assessment Tool</i>  <i>Assessment Framework: Activity Assessment, CONACT</i></p> <p><i>Standard</i>  <i>The model should be as realistic as possible and should maintain a set scale throughout. Photographs should show essential design features and structural materials and components</i>  <i>Performance rating of 3 for each applicable task</i></p>	40

**MODULE CON3100: COMMERCIAL STRUCTURES (continued)**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>• demonstrate commercial construction job site expectations and skill requirements</li> <li>• demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>• correct usage of appropriate rigging techniques and personal protective equipment.</li> </ul> <p><i>Standard</i>  <i>All procedures are performed according to accepted practices</i></p> <ul style="list-style-type: none"> <li>• observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p style="text-align: center;">40</p> <p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>• Foundations and Structural Systems</li> <li>• Walls and Surfaces</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• identify the major differences between a residential and commercial/institutional construction project</li> <li>• describe the techniques used to build a shallow and deep foundation for commercial/institutional buildings</li> <li>• describe the various floor systems and components that are used in commercial/institutional construction</li> <li>• compare structural steel framing techniques with those of reinforced concrete framing</li> <li>• explain the advantage of using curtain walls in highrise buildings</li> <li>• describe typical methods of installing utilities in commercial buildings</li> <li>• identify common methods of finishing exterior and interior surfaces</li> </ul>	<p>Highlight different uses, construction techniques, building codes and working conditions.</p> <p>Students should be encouraged to visit a construction site and interview the workers.</p>

**MODULE CON3100: COMMERCIAL STRUCTURES (continued)**

Concept	Specific Learner Expectations	Notes
<ul style="list-style-type: none"> <li>• Worker Safety</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• identify the personal protective equipment that is required on the job site</li> <li>• demonstrate the basic lift signals used on the construction site</li> <li>• identify typical rigging techniques that are used to transport materials</li> <li>• define the term safe working load</li> <li>• describe correct methods of installing and securing scaffolding</li> <li>• describe the role of a safety supervisor on a job site.</li> </ul>	<p>Demonstrate the proper use of ropes, chains and cables as well as shackles, hooks and knots.</p>
<p>Planning and Management</p>	<ul style="list-style-type: none"> <li>• describe worker expectations on a typical job site</li> <li>• list and describe the personal protective equipment required on a job site.</li> </ul>	
<p>Implementation</p>	<ul style="list-style-type: none"> <li>• demonstrate the proper use of:               <ul style="list-style-type: none"> <li>– slings and hitches</li> <li>– knots</li> <li>– hand signals</li> </ul> </li> <li>• produce a scale model or illustrated log that features common materials and techniques used in commercial/residential construction.</li> </ul>	
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• identify the working conditions, employment and training opportunities related to heavy construction</li> <li>• maintain a record of completed activities within a portfolio.</li> </ul>	



## MODULE CON3110: SITE MANAGEMENT

**Level:** Advanced

**Theme:** Building Systems (Processes and Applications)

**Prerequisite:** CON1070 Building Construction

**Module Description:** Students consider the efficient and timely delivery of a quality product. They investigate and report on site management theories and practices to produce a project management plan.

**Module Parameters:** Access to appropriate in-school and community resources.

### Curriculum and Assessment Standards

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<i>The student will:</i> <ul style="list-style-type: none"><li>• identify and describe the key elements of project management related to commercial and residential construction</li><li>• outline the roles and responsibilities of the principal players on a construction project</li><li>• apply site management theories and practices to create a management plan for a construction project</li></ul>	<i>Assessment of student achievement should be based on:</i> <ul style="list-style-type: none"><li>• identification and description of the major components and phases of project management plan</li><li>• accurate description of the roles and responsibilities of a project manager in relation to one or more key players found on a construction site</li><li>• development of a real or simulated management plan for a simple residential or light commercial project.</li></ul> <i>Assessment Tool</i> <i>Research Process, Management Principles and Practices, CON3110-1</i> <i>Standard</i> <i>Performance rating of 3</i>	30  35  35

**MODULE CON3110: SITE MANAGEMENT (continued)**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>Management Phases</li> <li>Planning</li> <li>Scheduling</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>identify the key elements of project management; e.g.:               <ul style="list-style-type: none"> <li>planning</li> <li>scheduling</li> <li>implementing</li> <li>controlling</li> </ul> </li> <li>describe the roles and responsibilities of the project manager in relation to:               <ul style="list-style-type: none"> <li>reviewing contractual agreements and deliverables</li> <li>establishing effective lines of communication with:                   <ul style="list-style-type: none"> <li>client</li> <li>suppliers</li> <li>contractors</li> <li>inspectors</li> </ul> </li> <li>determining site conditions and amenities; electrical, plumbing and gas supplies</li> </ul> </li> <li>compare the advantages and disadvantages of using the critical path and bar chart methods for scheduling a project</li> <li>identify strategies to help bring a project back on schedule</li> <li>describe the need for good communication and cooperation between various trades and occupations on a construction site</li> </ul>	<p>Have student understand that project management is the effective and efficient use of human and material resources.</p> <p>Discuss the importance of knowing the client's needs and being able to convey these to other players to avoid potential problems.</p> <p>If possible, use a computer program to plan a work schedule.</p> <p>Discuss the use of contingency time and running jobs in parallel.</p>

**MODULE CON3110: SITE MANAGEMENT (continued)**

Concept	Specific Learner Expectations	Notes
<ul style="list-style-type: none"> <li>• Implementing</li> <li>• Controlling</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• identify the primary tasks of completing a project in relation to:               <ul style="list-style-type: none"> <li>– managing supplies</li> <li>– managing contractors</li> <li>– arranging inspections</li> <li>– communicating with the client</li> <li>– keeping records</li> </ul> </li> <li>• research procedures to control:               <ul style="list-style-type: none"> <li>– safety on the work site</li> <li>– quality of work</li> <li>– removal and disposal of materials</li> <li>– project costs.</li> </ul> </li> </ul>	<p>Lines of communication must be kept open between the key players. Records should also be kept to document work in progress and work that has been completed.</p> <p>Remind students that project managers must be aware of the personal health and safety as well as environmental issues related to new and renovated structures.</p>
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Planning</li> <li>• Scheduling</li> <li>• Worker Roles and Relationships</li> </ul>	<ul style="list-style-type: none"> <li>• develop a work plan for a given project by determining:               <ul style="list-style-type: none"> <li>– what is to be done</li> <li>– how it will be done</li> <li>– who will do it</li> <li>– when it should be done</li> </ul> </li> <li>• schedule the work using a bar chart or critical path technique</li> <li>• report on the roles and responsibilities for one or more of the following job site positions:               <ul style="list-style-type: none"> <li>– site superintendent</li> <li>– safety supervisor</li> <li>– subtrade contractor</li> <li>– foreman</li> <li>– skilled worker.</li> </ul> </li> </ul>	<p>If possible, have students use a computer program to develop a work schedule.</p>
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Quality Control</li> </ul>	<ul style="list-style-type: none"> <li>• analyze a project and identify procedures to improve:               <ul style="list-style-type: none"> <li>– time management</li> <li>– quality of work</li> <li>– health and safety</li> <li>– cost-efficiencies</li> </ul> </li> </ul>	

**MODULE CON3110: SITE MANAGEMENT** (continued)

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

## MODULE CON3120: TOOL MAINTENANCE

**Level:** Advanced

**Theme:** Manufacturing Systems (Processes and Applications)

**Prerequisite:** CON1010 Basic Tools & Materials

**Module Description:** Students develop skills in preventive maintenance by routinely inspecting and servicing production tools and equipment.

**Module Parameters:** Access to a materials and/or construction facility and to instruction from an individual with specialized training in hand and power tool maintenance.

### 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"> <li>identify and describe the essential elements and desired outcomes of a preventive maintenance program</li> <li>prepare a maintenance schedule for a piece of equipment</li> <li>apply established maintenance procedures to assess and maintain hand and power tools</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>research project that correctly identifies and describes at least five positive outcomes of a preventive maintenance program</li> </ul>	20
	<ul style="list-style-type: none"> <li>development of a maintenance chart for a given power tool that identifies components and frequency of the service requirements.</li> </ul> <p><i>Assessment Tool</i> <i>Assessment Framework: Research Process, CTSRES</i></p> <p><i>Standard</i> <i>Performance rating of 3 for each applicable task</i></p>	20
	<ul style="list-style-type: none"> <li>ongoing student involvement in the assessment and maintenance of hand and power tools.</li> </ul> <p><i>Assessment Tool</i> <i>Assessment Framework: Activity Assessment, CONACT</i></p> <p><i>Standard</i> <i>Tools are maintained according to accepted practice and the manufacturer's recommendations</i> <i>Performance rating of 3 for each applicable task</i></p>	60

**MODULE CON3120: TOOL MAINTENANCE** (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>Preventive Maintenance Components</li> <li>Tool Maintenance</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>explain reasons for establishing a preventive maintenance program</li> <li>identify the essential elements of a preventive maintenance program; e.g.:               <ul style="list-style-type: none"> <li>scheduling and performing periodic maintenance functions</li> <li>repairing faulty equipment</li> <li>keeping records of service and maintenance work</li> <li>tagging or removing equipment that is out of order</li> </ul> </li> <li>show a list of parameters for setting up a maintenance schedule; e.g.:               <ul style="list-style-type: none"> <li>age of equipment</li> <li>frequency of use</li> <li>manufacturer's recommendations</li> <li>past performance</li> </ul> </li> <li>identify recommended grinding and honing angles for:               <ul style="list-style-type: none"> <li>plane irons</li> <li>wood chisels</li> <li>wood turning tools</li> </ul> </li> <li>calculate twist drill point angles and lip clearances for drilling metals and plastics</li> </ul>	<p>This module provides opportunity for senior students to become skilled in machine tool maintenance.</p> <p>Demonstrate proper sharpening techniques for common edge cutting tools.</p>

**MODULE CON3120: TOOL MAINTENANCE (continued)**

Concept	Specific Learner Expectations	Notes
<ul style="list-style-type: none"> <li>• Equipment Maintenance</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• list and describe the types of adjustments and service requirements of a:               <ul style="list-style-type: none"> <li>– table saw</li> <li>– band saw</li> <li>– scroll saw</li> <li>– jointer</li> <li>– surface planer</li> <li>– portable equipment</li> <li>– drill press</li> <li>– etc.</li> </ul> </li> <li>• identify tools that require safety accessories such as a push stick.</li> </ul>	<p>Demonstrate appropriate methods to remove and install saw blades, cutting knives, sanding discs and belts.</p>
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Service Scheduling</li> </ul>	<ul style="list-style-type: none"> <li>• prepare a service schedule for a number of production tools and pieces of equipment</li> <li>• design a safety accessory for a specific tool.</li> </ul>	<p>Explain how machining flaws such as burns, skips or snips are a result of dull edges or improperly adjusted equipment.</p>
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Service and Maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• demonstrate a routine inspection of lab tools and equipment</li> <li>• perform maintenance services as required</li> <li>• build a safety accessory.</li> </ul>	<p>Have students consider making a fixed or adjustable taper jig, push block or other safety accessory.</p>
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• identify occupation and trade qualifications related to tool and machine maintenance</li> <li>• maintain a record of completed activities within a portfolio.</li> </ul>	



## MODULE CON3130: FURNITURE MAKING 3 (LEG & RAIL)

**Level:** Advanced

**Theme:** Manufacturing Systems (Processes and Applications)

**Prerequisite:** CON1120 Project Management

**Module Description:** Students use solid and/or manufactured materials and leg-and-rail or pedestal construction techniques to build a free-standing piece of furniture.

**Module Parameters:** Access to a materials and/or construction facility and to instruction from an individual with formal, specialized training in furniture and cabinetmaking.

**Supporting Modules:** CON2130 Furniture Making 1 (Box Construction)  
CON2140 Furniture Making 2 (Frame & Panel)

### 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"><li>• identify and describe the design features and joinery techniques of a typical leg-and-rail piece of furniture</li><li>• apply drawing and estimating skills and techniques to prepare a shop drawing, detailed material list and cost estimate</li><li>• plan and build a piece of furniture, using leg-and-rail construction techniques</li></ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"><li>• analysis of a working drawing to determine the construction details of a leg-and-rail or pedestal piece of furniture</li><li>• application of technical drawing and estimating skills to make an accurate material list and cost estimate</li><li>• application of advanced joinery and finishing skills and techniques used to make a leg-and-rail or pedestal product.</li></ul> <p><i>Assessment Tool</i> <i>Project Assessment: Leg-and-Rail Construction, CON3130-1</i></p> <p><i>Standard</i> <i>The finished product will be constructed using the appropriate materials, joinery and finishing techniques. Joints are to be flush, tight fitting and square; finished surfaces are to be smooth and free from production defects. Overall dimensions should be within <math>\pm 2</math> mm</i> <i>Performance rating of 3 for each applicable task</i></p>	<p>10</p> <p>20</p> <p>70</p>

**MODULE CON3130: FURNITURE MAKING 3 (LEG & RAIL) (continued)**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>Leg-and-Rail Construction</li> <li>Table Construction</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>describe typical design and joinery techniques used in leg-and-rail and pedestal construction</li> <li>identify common methods and fastening systems to secure a wood top to an under-frame; e.g.:               <ul style="list-style-type: none"> <li>wood buttons</li> <li>metal plates</li> <li>pocket drilling</li> <li>blocks</li> </ul> </li> <li>describe common methods of transferring a pattern to a work piece such as a table leg or pedestal</li> <li>describe an appropriate method to reed and flute a surface.</li> </ul>	<p>Discuss the issue of form and function when investigating various leg-and-rail and/or pedestal design.</p>

**MODULE CON3130: FURNITURE MAKING 3 (LEG & RAIL) (continued)**

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Product Design</li> <li>• Work Scheduling and Estimating</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• select a product that requires the use of:               <ul style="list-style-type: none"> <li>– leg-and-rail or pedestal components</li> <li>– solid woods and/or composite materials</li> </ul> </li> <li>• interpret a working drawing to prepare a detailed material list and event schedule</li> <li>• design and build the required jigs and templates.</li> </ul>	
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Material Processing</li> </ul>	<ul style="list-style-type: none"> <li>• use the appropriate tools, material and processes to:               <ul style="list-style-type: none"> <li>– measure and lay out stock</li> <li>– cut and shape components</li> <li>– machine appropriate joints</li> <li>– assemble with suitable fasteners</li> <li>– prepare for finishing.</li> </ul> </li> </ul>	<p>The project may be finished in conjunction with CON2150: Finishing &amp; Refinishing.</p>
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• identify the further educational and skill-building opportunities related to custom furniture making</li> <li>• maintain a record of completed activities within a portfolio.</li> </ul>	



**MODULE CON3140: FURNITURE MAKING 4 (SURFACE ENHANCEMENT)**

**Level:** Advanced

**Theme:** Manufacturing Systems (Processes and Applications)

**Prerequisite:** CON1120 Project Management

**Module Description:** Students explore and demonstrate the use of veneer, inlay, carving and/or marquetry techniques to enhance the appearance of a product or component.

**Module Parameters:** Access to a materials and/or construction facility and to instruction from an individual with formal, specialized training in furniture and cabinetmaking.

**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"> <li>• identify and describe methods of matching wood veneer</li> <li>• differentiate between inlay, marquetry and carving techniques</li> <li>• create a veneer, inlay or carving feature for a product or component</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>• a written response that correctly identifies and describes at least four methods of matching wood veneer</li> <li>• a written response that correctly identifies the differences between inlay, marquetry and carving techniques.</li> </ul> <p><i>Assessment Tool</i>  <i>Response Assessment: Surface Enhancements, CON3140-1</i></p> <p><i>Standard</i>  <i>Performance rating of 3 for each applicable task</i></p> <ul style="list-style-type: none"> <li>• application of veneering/inlaying or carving skills and techniques on a component or a product.</li> </ul> <p><i>Assessment Tool</i>  <i>Assessment Framework: Project Assessment, CONPRO</i></p> <p><i>Standard</i>  <i>The enhancement will be tight fitting, appropriately matched and detailed using materials that add to the overall appearance and value of the product</i>  <i>Performance rating of 3 for each applicable task</i></p>	<p>15</p> <p>15</p> <p>70</p>

**MODULE CON3140: FURNITURE MAKING 4 (SURFACE ENHANCEMENT) (continued)**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>Veneering</li> <li>Marquetry and Inlaying</li> <li>Carving</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>describe the principal methods used to produce a wood veneer; e.g.:                             <ul style="list-style-type: none"> <li>rotary cutting</li> <li>flat or plain slicing</li> <li>quarter slicing</li> <li>right and half round cutting</li> </ul> </li> <li>identify the methods used to match veneer such as:                             <ul style="list-style-type: none"> <li>slip</li> <li>diamond</li> <li>checkerboard</li> <li>book</li> </ul> </li> <li>describe successful cutting and applying techniques</li> <li>differentiate between marquetry and inlaying</li> <li>explain how hand and machine carving differ.</li> </ul>	<p>Discuss the advantages and disadvantages of using different core materials and adhesives.</p>

**MODULE CON3140: FURNITURE MAKING 4 (SURFACE ENHANCEMENT) (continued)**

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Product Selection</li> <li>• Design</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• identify a product or component that:               <ul style="list-style-type: none"> <li>– requires veneering</li> <li>– is enhanced by a carved, inlaid or marquetry feature</li> </ul> </li> <li>• select an appropriate veneer</li> <li>• sketch the desired veneer match</li> <li>• sketch a design for a carved, inlaid or marquetry feature.</li> </ul>	
<p>Implementation</p>	<ul style="list-style-type: none"> <li>• use appropriate tools, materials and processes to:               <ul style="list-style-type: none"> <li>– cut and fit the veneer</li> <li>– apply and glue a veneer</li> <li>– create an inlay, marquetry or carving feature.</li> </ul> </li> </ul>	
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• identify the employment and business opportunities related to advanced furniture making</li> <li>• maintain a record of completed activities within a portfolio.</li> </ul>	



## MODULE CON3150: FURNITURE REPAIR

**Level:** Advanced

**Theme:** Manufacturing Systems (Processes and Applications)

**Prerequisite:** CON1120 Project Management

**Module Description:** Students apply basic knowledge of furniture construction and materials to repair or replace existing components or coverings.

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

**Supporting Modules:** CON2150 Finishing & Refinishing  
FAS2150 Upholstery [Fashion Studies Strand]

### 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"> <li>• assess the condition of a piece of furniture to determine whether it can be economically repaired or restored</li> <li>• prepare a repair/restoration plan and cost estimate</li> <li>• repair/restore a piece of furniture</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>• the analysis of an existing piece of furniture to determine the feasibility of repairing or restoring the product</li> <li>• the development of a repair/restoration plan and estimate for a given piece of furniture or millwork</li> <li>• the application of repair and restoration skills.</li> </ul> <p><i>Assessment Tool</i> <i>Project Assessment: Repairing/Restoring Furniture, CON3150-1</i></p> <p><i>Standard</i> <i>The integrity and usefulness of the product have been maintained while meeting the clients needs and expectations</i> <i>Performance rating of 3 for each applicable task</i></p>	<p>20</p> <p>15</p> <p>65</p>

**MODULE CON3150: FURNITURE REPAIR** (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>Furniture Appraisal</li> <li>Repair and Restoration Techniques</li> <li>Health and Safety</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>identify the factors that determine whether a piece of furniture is worth repairing or restoring</li> <li>describe safe and efficient methods to:               <ul style="list-style-type: none"> <li>loosen old glue and clean joints</li> <li>remove and replace dowel pins</li> <li>tighten loose joints</li> <li>patch or repair a veneer surface</li> <li>splice a component</li> <li>repair and/or replace a plastic molding</li> </ul> </li> <li>identify practical methods to determine the nature of the original structural materials and finishes</li> <li>identify the design features that might have caused a component to fail</li> <li>describe the hazards associated with stripping old paint, varnish and lacquer finishes.</li> </ul>	<p>Encourage students to establish the restored and unrestored value of a piece of furniture before work begins.</p> <p>Discuss the use of common adhesives such as:</p> <ul style="list-style-type: none"> <li>animal</li> <li>casein</li> <li>white liquid resin</li> <li>yellow resin glue</li> <li>epoxy cement</li> <li>contact cement</li> <li>heat activated glue.</li> </ul> <p>Associating failures with a specific design will help students design features better products in the future.</p>

**MODULE CON3150: FURNITURE REPAIR** (continued)

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Feasibility Study</li> <li>• Estimating</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• describe the overall condition and feasibility of restoring a given piece of furniture</li> <li>• estimate the time, supply and material cost to:               <ul style="list-style-type: none"> <li>– disassemble</li> <li>– strip down</li> <li>– repair</li> <li>– reassemble</li> <li>– refinish.</li> </ul> </li> </ul>	
<p>Implementation</p>	<ul style="list-style-type: none"> <li>• use the appropriate tools, materials and processes to repair and restore a piece of furniture.</li> </ul>	
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• research employment and business opportunities pertaining to furniture repair and restoration</li> <li>• maintain a record of completed activities within a portfolio.</li> </ul>	



**MODULE CON3160: CABINETMAKING 3 (CABINETS/COUNTERTOPS)**

**Level:** Advanced

**Theme:** Manufacturing Systems (Processes and Applications)

**Prerequisite:** CON1120 Project Management

**Module Description:** Students develop the knowledge and skills required to build and install a simple cabinet/countertop complete with an appropriate backsplash and edge treatment.

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

**Supporting Module:** CON1160 Manufactured 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"> <li>identify and describe common types of cabinets/countertops and installation procedures</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>the presentation of a written report that demonstrates knowledge of:                             <ul style="list-style-type: none"> <li>types of countertops currently used in cabinet production</li> <li>ways in which edges may be concealed to produce an esthetically pleasing product</li> <li>common methods of countertop installation with particular emphasis on fastener concealment.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>Assessment Framework: Presentations/Reports, CTSPRE</i></p> <p><i>Standard</i>  <i>Performance rating of 3 for each applicable task</i></p>	<p>15</p>
<ul style="list-style-type: none"> <li>identify and describe a suitable edge treatment for a given application</li> </ul>	<ul style="list-style-type: none"> <li>development of a mock-up or sample display of at least two different edge treatments.</li> </ul> <p><i>Assessment Tool</i>  <i>Assessment Framework: Activity Assessment, CONACT</i></p> <p><i>Standard</i>  <i>Samples should be securely bonded. Edges should be flush and free of sharp corners or chips and traces of cement</i>  <i>Performance rating of 3 for each applicable task</i></p>	<p>15</p>

**MODULE CON3160: CABINETMAKING 3 (CABINETS/COUNTERTOPS)** (continued)

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>• apply/install a given material to produce a suitable cabinet/ countertop</li>   <li>• demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>• construction and installation of a cabinet/countertop for a given application.</li> </ul> <p><i>Assessment Tool</i>  <i>Assessment Framework: Activity Assessment, CONACT</i></p> <p><i>Standard</i>  <i>The cabinet/countertop dimensions should be accurate to within 1 mm of the specifications and the finished product should be completely free of finish blemishes. An accepted and appropriate edge treatment should be employed, and any fasteners used in its application should be concealed</i></p> <p><i>Performance rating of 3</i></p> <ul style="list-style-type: none"> <li>• observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>70</p> <p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>• Types of Materials</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• identify common countertop materials: <ul style="list-style-type: none"> <li>– ceramic tile</li> <li>– plastic laminate</li> <li>– natural and synthetic marble</li> <li>– molded laminates</li> </ul> </li> <li>• identify typical methods and materials used to seal components</li> </ul>	

**MODULE CON3160: CABINETMAKING 3 (CABINETS/COUNTERTOPS)** (continued)

Concept	Specific Learner Expectations	Notes
<ul style="list-style-type: none"> <li>• Application Techniques</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• describe the processes used to:               <ul style="list-style-type: none"> <li>– apply ceramic tile</li> <li>– apply plastic laminates</li> <li>– install manufactured tops</li> </ul> </li> <li>• identify and describe typical edge treatments used with a given cabinet/countertop material</li> <li>• describe standard procedures to:               <ul style="list-style-type: none"> <li>– cut and trim plastic laminates</li> <li>– cut ceramic tile.</li> </ul> </li> </ul>	
<p>Health and Safety</p>	<ul style="list-style-type: none"> <li>• list and demonstrate the safe use of power tools used to install cabinet/countertop materials</li> <li>• describe the health and safety issues that pertain to the use of specific solvents and adhesives.</li> </ul>	
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Material Selection</li> <li>• Work Scheduling</li> </ul>	<ul style="list-style-type: none"> <li>• select the appropriate material and edge treatment for a given application</li> <li>• prepare a detailed material and procedural list</li> <li>• identify and note the location of fixtures.</li> </ul>	<p>The skills in this module can be assessed on a full-size project or on a mock-up.</p>
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Material Processing</li> </ul>	<ul style="list-style-type: none"> <li>• use the appropriate tools, materials and processes to:               <ul style="list-style-type: none"> <li>– measure and mark stock</li> <li>– cut and fit materials</li> <li>– attach component</li> <li>– apply materials and edge treatment</li> <li>– locate and prepare openings for fixtures</li> <li>– clean and seal.</li> </ul> </li> </ul>	<p>Stress the importance of using personal protective equipment, particularly related to tile cutting and use of power tools.</p>

**MODULE CON3160: CABINETMAKING 3 (CABINETS/COUNTERTOPS)** (continued)

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

**MODULE CON3170: CABINETMAKING 4 (LAYOUT & INSTALLATION)**

<b>Level:</b>	Advanced
<b>Theme:</b>	Manufacturing Systems (Processes and Applications)
<b>Prerequisite:</b>	CON1120 Project Management
<b>Module Description:</b>	Students develop a floor/wall cabinet plan and order and install a set of prebuilt cabinets.

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

**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"> <li>design a room layout and prepare a cabinet schedule</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>the development of a scale drawing in plan view, accompanied by preliminary sketches and a complete cabinet schedule.</li> </ul> <p><i>Assessment Tool</i>  <i>Assessment Framework: Activity Assessment, CONACT</i></p> <p><i>Standard</i>  <i>The layout should conform to the principles of the work triangle and meet current standards for depth, height and distances between upper and lower cabinets and allowances for appliances. The cabinet schedule should be fully detailed and contain accurate measurements. A master layout or story pole should accompany the drawing</i>  <i>Performance rating of 3 for each applicable task</i></p>	20
<ul style="list-style-type: none"> <li>lay out and install a set of cabinets and countertops</li> </ul>	<ul style="list-style-type: none"> <li>the installation of a set of cabinets and countertop is in a mock-up or actual job site situation.</li> </ul> <p><i>Assessment Tool</i>  <i>Assessment Framework: Activity Assessment, CONACT</i></p> <p><i>Standard</i>  <i>Components are positioned according to the layout drawing, levelled and securely fastened. Components, fillers and countertops are scribe fit where needed. Doors and drawers are aligned and tested</i>  <i>Performance rating of 3 for each applicable task</i></p>	65

**MODULE CON3170: CABINETMAKING 4 (LAYOUT & INSTALLATION) (continued)**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>• create a profile of a trade or occupation within the cabinetmaking field</li>   <li>• demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>• presentation of an occupation profile that outlines:               <ul style="list-style-type: none"> <li>– employment opportunities</li> <li>– training and entry requirements</li> <li>– working conditions.</li> </ul> </li> </ul> <p><i>Assessment Tool</i>  <i>Assessment Framework: Research Process, CTSRES</i></p> <p><i>Standard</i>  <i>Performance rating of 3 for each applicable task</i></p> <ul style="list-style-type: none"> <li>• observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>15</p> <p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
Orientation	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• identify and describe the principles of various kitchen, bathroom and workroom layouts</li> <li>• describe the procedures used to level a set of cabinets</li> <li>• describe the techniques and fasteners used to attach cabinets together, to the floor, ceiling and wall structures.</li> </ul>	<p>Discuss the principle of the work triangle in kitchen or other work space.</p>

**MODULE CON3170: CABINETMAKING 4 (LAYOUT & INSTALLATION) (continued)**

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• use a set of drawings and specifications to determine the size, location and type of modular units</li> <li>• prepare a story pole or master layout on plywood or cardboard for a specified section of a cabinet installation</li> <li>• check and note irregularities in walls and floors</li> <li>• identify cabinet modifications owing to irregularities and service outlets.</li> </ul>	<p>Use a CAD system if possible.</p>
<p>Implementation</p>	<ul style="list-style-type: none"> <li>• use the appropriate tools, materials and processes to:               <ul style="list-style-type: none"> <li>– locate and level units</li> <li>– assemble and install units</li> <li>– install countertops</li> <li>– apply fillers and moldings</li> <li>– adjust fit of doors and drawers.</li> </ul> </li> </ul>	<p>Besides a regular kitchen, consider a child's play kitchen as a possible project.</p>
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• identify employment opportunities related to:               <ul style="list-style-type: none"> <li>– kitchen and bathroom design</li> <li>– cabinet manufacturing</li> <li>– installing cabinets</li> </ul> </li> <li>• describe personal interests and abilities related to making realistic career choices</li> <li>• maintain a record of completed activities within a portfolio.</li> </ul>	



## MODULE CON3190: PRODUCTION PLANNING

**Level:** Advanced

**Theme:** Manufacturing Systems (Processes and Applications)

**Prerequisite:** CON2200 Product Development

**Module Description:** Students plan, individually or as team members, a production system, and create the necessary work cells and floor plan to produce a given product in a safe and efficient manner.

**Module Parameters:** Access to a building site and/or construction facility and to instruction from an individual with specialized training in production 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"> <li>identify the characteristics of an efficient production system</li> <li>analyze a product to determine the necessary production processes and tools</li> <li>create a production flow chart and/or facility layout</li> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>presentation of a written report that outlines the elements that contribute to the development of an efficient production system</li> <li>analysis of a given product to determine the tools, materials and processes to create a production flow chart and locate the required jigs, fixtures and tools.</li> </ul> <p><i>Assessment Tool</i> <i>Presentations/Reports: Planning for Efficiency, CON3190-1</i></p> <p><i>Standard</i> <i>Performance rating of 3 for each applicable task</i></p> <ul style="list-style-type: none"> <li>observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i> <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>15</p> <p>70</p> <p>15</p> <p>Integrated throughout</p>

**MODULE CON3190: PRODUCTION PLANNING** (continued)

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>• Production Methods</li> <li>• Health and Safety</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• describe the factors that determine whether a product part or component will be built or purchased</li> <li>• describe the production methods that are used to separate, combine and form materials</li> <li>• describe common methods of material and product handling</li> <li>• identify the conditions that contribute to a efficient production system; e.g.:               <ul style="list-style-type: none"> <li>– use of flexible equipment</li> <li>– zero tolerance</li> <li>– multi-skilled work teams</li> <li>– authority delegated to the workers</li> </ul> </li> <li>• identify methods to control:               <ul style="list-style-type: none"> <li>– inventory</li> <li>– production</li> <li>– quality</li> </ul> </li> <li>• list and describe typical safety regulations that govern:               <ul style="list-style-type: none"> <li>– space between equipment</li> <li>– type of floor surfaces</li> <li>– amount of light</li> <li>– air quality control.</li> </ul> </li> </ul>	<p>It may be more economical to purchase a part than to make it.</p> <p>Consider ways to avoid “bottlenecks” and back-tracking.</p> <p>Discuss the move back to building a complete product using a team approach rather than using mass production techniques.</p>
<p>Planning and Management</p>	<ul style="list-style-type: none"> <li>• break a given product down into its separate parts and identify how each part can be fabricated</li> <li>• show a flow chart for the movement of materials and products</li> <li>• train personnel for specific tasks.</li> </ul>	
<p>Implementation</p>	<ul style="list-style-type: none"> <li>• design and build the necessary jigs, fixtures and templates for a given part and process</li> <li>• organize the required equipment to create a required work cell or shop layout.</li> </ul>	

**MODULE CON3190: PRODUCTION PLANNING** (continued)

Concept	Specific Learner Expectations	Notes
Assessment <ul style="list-style-type: none"><li>• Quality Control</li><li>• Career Preparation</li></ul>	<i>The student should:</i> <ul style="list-style-type: none"><li>• test and improve the production processes if necessary</li><li>• maintain a record of completed activities within a portfolio.</li></ul>	



**MODULE CON3200: PRODUCTION MANAGEMENT**

**Level:** Advanced

**Theme:** Manufacturing Systems (Processes and Applications)

**Prerequisite:** CON3190 Production Planning

**Module Description:** Students identify and enhance management skills in relation to the development and deployment of people and physical resources.

**Module Parameters:** Access to a materials and/or construction facility and to instruction from an individual with specialized training in production 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"> <li>• describe effective production management strategies</li> <li>• develop a system to manage and schedule work and to control materials and completed products</li> <li>• use effective management skills to operate an efficient production system</li> <li>• demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"> <li>• presentation of a written report that outlines the role of management in relationship to planning, organizing and allocating resources</li> <li>• describes a system to schedule work, order and inventory materials and track completed products</li> <li>• implementation of a management plan to produce a given product.</li> </ul> <p><i>Assessment Tool</i>  <i>Presentations/Reports: Quality Management, CON3200-1</i></p> <p><i>Standard</i>  <i>Performance rating of 3 for each applicable task</i></p> <ul style="list-style-type: none"> <li>• observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>35</p> <p>65</p> <p>Integrated throughout</p>

**MODULE CON3200: PRODUCTION MANAGEMENT** (continued)

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>• Role of Management</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• define the role of management in a production system</li> <li>• identify and describe the key management elements; e.g.:               <ul style="list-style-type: none"> <li>– planning</li> <li>– organizing</li> <li>– leading</li> <li>– controlling</li> </ul> </li> <li>• identify the functions that are the responsibility of a management team; e.g.:               <ul style="list-style-type: none"> <li>– marketing</li> <li>– research and development</li> <li>– production</li> <li>– servicing</li> <li>– finance</li> <li>– training.</li> </ul> </li> </ul>	<p>Students should be asked to participate in management activities as well as in production.</p> <p>Discuss total quality management principles.</p>
<p>Management Techniques</p>	<ul style="list-style-type: none"> <li>• identify and describe typical scheduling techniques used by production managers such as a PERT chart (Program Evaluation Review Technique)</li> <li>• differentiate between quality control and total quality management</li> <li>• compare labour–management relations in a traditional and automated settings</li> <li>• describe the role government has in overseeing production such as:               <ul style="list-style-type: none"> <li>– Occupational Health and Safety</li> <li>– Workers’ Compensation</li> <li>– Alberta Environmental Protection.</li> </ul> </li> </ul>	
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Scheduling</li> </ul>	<ul style="list-style-type: none"> <li>• prepare a PERT chart or other scheduling device for a production project</li> </ul>	

**MODULE CON3200: PRODUCTION MANAGEMENT** (continued)

Concept	Specific Learner Expectations	Notes
<ul style="list-style-type: none"> <li>• Business Plan</li> <li>• Working Conditions and Relations</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• produce a simple business plan by outlining its purpose, performing a cash flow analysis and predicting its profitability</li> <li>• plan, implement and monitor a safety program for a production project</li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>• create a system to improve working conditions and job satisfaction.</li> </ul>	
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• describe the career preparation and management opportunities related to a production industry</li> <li>• maintain a record of completed activities within a portfolio.</li> </ul>	



## MODULE CON3210: FRAMING SYSTEMS 2 (FLOOR, WALL & CEILING)

**Level:** Advanced

**Theme:** Building Systems (Processes and Applications)

**Prerequisite:** CON2040 Framing Systems 1 (Floor & Wall)

**Module Description:** Students develop appropriate layout and assembly skills to install conventional and/or engineered framing components associated with residential and/or light commercial construction.

**Module Parameters:** Access to a building site and/or construction facility and to instruction from an individual with formal, 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"><li>compare conventional and engineered framing systems and components</li></ul>	<p><i>Assessment of student achievement should be based on:</i></p> <ul style="list-style-type: none"><li>a written or oral response that describes and compares the components and procedures used to construct a floor, wall and ceiling frame and support system using conventional lumber and engineered components.</li></ul> <p><i>Assessment Tool</i> <i>Response Assessment: Framing Systems, CON3210-1</i></p> <p><i>Standard</i> <i>Response rating of 3</i></p>	20
<ul style="list-style-type: none"><li>apply print-reading and estimating principles to prepare a material list and cost estimate for a structure that incorporates conventional and/or engineered framing components</li></ul>	<ul style="list-style-type: none"><li>preparation of a framing plan, material list and cost estimate given a typical residential or light commercial drawing and span tables</li></ul>	15
<ul style="list-style-type: none"><li>demonstrate advanced framing, layout and assembly skills</li></ul>	<ul style="list-style-type: none"><li>observation of framing skills through on-site and/or in-shop work.</li></ul> <p><i>Assessment Tool</i> <i>Construction Activity: Framing, CON3210-2</i></p> <p><i>Standard</i> <i>Performance rating of 3 for each applicable task</i></p>	65

**MODULE CON3210: FRAMING SYSTEMS 2 (FLOOR, WALL & CEILING) (continued)**

Module Learner Expectations	Assessment Criteria and Conditions	Suggested Emphasis
<p><i>The student will:</i></p> <ul style="list-style-type: none"> <li>demonstrate basic competencies.</li> </ul>	<p><i>Assessment of student assessment should be based on:</i></p> <ul style="list-style-type: none"> <li>observations of individual effort and interpersonal interaction during the learning process.</li> </ul> <p><i>Assessment Tool</i>  <i>Basic Competencies Reference Guide and any assessment tools noted above</i></p>	<p>Integrated throughout</p>

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>Floor Support Systems</li> <li>Framing Systems</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>describe the parts of a typical residential floor and wall frame and support system</li> <li>identify and describe two common types of posts used in floor framing support systems</li> <li>compare the advantages and disadvantages of:                             <ul style="list-style-type: none"> <li>built-up beams</li> <li>solid timber beams</li> <li>laminated beams</li> <li>steel beams</li> </ul> </li> <li>compare the advantages and disadvantages of using:                             <ul style="list-style-type: none"> <li>conventional framing materials</li> <li>truss joists</li> <li>wooden I-beams</li> <li>metal joists/studs</li> </ul> </li> <li>identify and describe typical procedures that are used to join floor joists to a foundation or wall section</li> </ul>	<p>Discuss the effects that live and dead loads, lateral pressure and intermittent loads have on the design of a structure.</p> <p>Explain how to construct a built-up beam to meet Alberta Building Code requirements.</p> <p>Explain how joists can be embedded, accommodate a brick finish or be attached to a sill plate.</p>

**MODULE CON3210: FRAMING SYSTEMS 2 (FLOOR, WALL & CEILING) (continued)**

Concept	Specific Learner Expectations	Notes
<p>Orientation</p> <ul style="list-style-type: none"> <li>• Framing Systems (continued)</li> <li>• Floor and Wall Restraining, Notching and Drilling</li> <li>• Floor and Wall Sheathing</li> <li>• Health and Safety Issues</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• compare different methods used to attach floor joists to steel and built-up beams</li> <li>• identify typical framing procedures used in relation to:               <ul style="list-style-type: none"> <li>– load and non-load bearing partitions</li> <li>– stair, chimney and stack openings</li> <li>– parallel and 90° cantilevers</li> </ul> </li> <li>• identify and describe common methods of bridging floors and bracing walls:               <ul style="list-style-type: none"> <li>– cross-bridging</li> <li>– continuous wood strapping</li> <li>– solid blocking</li> <li>– continuous steel strapping</li> </ul> </li> <li>• identify code requirements related to notching and drilling floor joists and wall studs</li> <li>• identify common types of sub-flooring materials, underlayments and wall sheathing</li> <li>• identify the purpose and types of connectors/ties and adhesives that are used in conjunction with the application of flooring and sheathing components</li> <li>• identify appropriate methods to cover floor/wall openings and construct temporary railings to code</li> <li>• describe safe operation of portable electric and air activated hand tools</li> <li>• identify appropriate personal protective equipment used on the job site.</li> </ul>	<p>Discuss the use of joist hangers and ledger boards.</p> <p>Discuss code requirements for installing a sub-floor and wall covering.</p>

**MODULE CON3210: FRAMING SYSTEMS 2 (FLOOR, WALL & CEILING) (continued)**

Concept	Specific Learner Expectations	Notes
<p>Planning and Management</p> <ul style="list-style-type: none"> <li>• Estimating</li> </ul>	<p><i>The student should:</i></p> <ul style="list-style-type: none"> <li>• use the appropriate tables to determine the clear spans, actual lengths of joists/headers for a variety of framing materials and applications</li> <li>• estimate the size and quantities of materials required to construct a floor/wall/ceiling system.</li> </ul>	<p>Engineered components should be sized to eliminate waste.</p>
<p>Implementation</p> <ul style="list-style-type: none"> <li>• Construction Techniques</li> <li>• Health and Safety</li> </ul>	<ul style="list-style-type: none"> <li>• develop skills in relation to: <ul style="list-style-type: none"> <li>– built up beam and header construction and installation</li> <li>– cutting, layout and installation and sheathing of floor, wall and ceiling components</li> <li>– squaring and applying sub-floor materials</li> <li>– framing walls and ceiling</li> </ul> </li> <li>• demonstrate proper lifting techniques</li> <li>• use proper personal protective equipment</li> <li>• demonstrate appropriate temporary bracing techniques</li> <li>• demonstrate proper care and use of hand and power assisted tools</li> <li>• secure all floor, wall and ceiling openings.</li> </ul>	<p>Stress the importance of following appropriate squaring and plumbing techniques.</p> <p>Check condition of ladders and ensure safe angle ratios.</p>
<p>Assessment</p> <ul style="list-style-type: none"> <li>• Quality Control</li> <li>• Career Information</li> <li>• Career Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• check alignment of crowns and bridging systems as well as the application of fasteners and adhesives</li> <li>• identify further training and career opportunities related to the manufacture and installation of conventional and engineered components</li> <li>• maintain a record of completed activities within a portfolio.</li> </ul>	