
CAREER AND TECHNOLOGY STUDIES

A. PROGRAM RATIONALE AND PHILOSOPHY

Through Career and Technology Studies (CTS), secondary education in Alberta is responding to the many challenges of modern society, helping young people develop daily living skills and nurturing a flexible, well-qualified work force.

In Canada's information society, characterized by rapid change in the social and economic environment, students must be confident in their ability to respond to change and successfully meet the challenges they face in their own personal and work lives. In particular, they make decisions about what they will do when they finish high school. Many students will enter the work force, others will continue their education. All students face the challenges of growing independence and responsibility, and of entering post-secondary programs and/or the highly competitive workplace.

Secondary schools also face challenges. They must deliver, on a consistent basis, high quality, cost-effective programs that students, parents and the community find credible and relevant.

CTS helps schools and students meet these challenges. Schools can respond more efficiently and effectively to student and community needs and expectations by taking advantage of the opportunities in the CTS curriculum to design courses and access school, community and distance learning resources. Students can develop the confidence they need as they move into adult roles by assuming increased responsibility for their

learning; cultivating their individual talents, interests and abilities; and by defining and acting on their goals.

As an important component of education in Alberta secondary schools, CTS promotes student achievement by setting clear expectations and recognizing student success. Students in CTS develop competencies—the knowledge, skills and attitudes they are expected to demonstrate, that is, what they know and what they are able to do.

Acquired competencies can be applied now and in the future as students make a smooth transition into adult roles in the family, community, workplace and/or further education. To facilitate this transition, clearly stated expectations and standards have been defined in cooperation with teachers, business and industry representatives and post-secondary educators.

CTS offers all students important learning opportunities. Regardless of the particular area of study chosen, *students in CTS will:*

- develop skills that can be applied in their daily lives, now and in the future
- refine career-planning skills
- develop technology-related skills
- enhance employability skills
- apply and reinforce learnings developed in other subject areas.

In CTS, students build skills they can apply in their everyday lives. For example, in the CTS program, particularly at the introductory levels, students have the opportunity to improve their ability to make sound consumer decisions and to appreciate environmental and safety precautions.



A career encompasses more than activities just related to a person's job or occupation; it involves one's personal life in both local and global contexts; e.g., as a family member, a friend, a community volunteer, a citizen of the world.

The integration of careers throughout the CTS program helps students to make effective career decisions and to target their efforts. CTS students will have the opportunity to expand their knowledge about careers, occupations and job opportunities, as well as the education and/or training requirements involved. Also, students come to recognize the need for lifelong learning.

Students in CTS have the opportunity to use and apply technology and systems effectively and efficiently. This involves:

- a decision regarding which processes and procedures best suit the task at hand
- the appropriate selection and skilled use of the tools and/or resources available
- an assessment of and management of the impact the use of the technology may have on themselves, on others and on the environment.



Integrated throughout CTS are employability skills, those basic competencies that help students develop their personal management and social skills. Personal management skills are improved as students take increased responsibility for their learning, design innovative solutions to problems and challenges, and manage resources effectively and efficiently. Social skills improve through learning experiences that require students to work effectively with others, demonstrate teamwork and leadership, and maintain high standards in safety and accountability.

As well as honing employability skills, CTS reinforces and enhances learnings developed in core and other optional courses. The curriculum emphasizes, as appropriate, the effective application of communication and numeracy skills.

In addition to the common outcomes described above, students focusing on a particular area of study will develop career-specific competencies that support entry into the workplace and/or related post-secondary programs. Career-specific competencies can involve understanding and applying appropriate terminology, processes and technologies related to a specific career, occupation or job.

PROGRAM OUTCOMES

The program outcomes describe the basic competencies integrated throughout the CTS program.

Within an applied context relevant to personal goals, aptitudes and abilities; *the student* in CTS will:

- demonstrate the basic knowledge, skills and attitudes necessary for achievement and fulfillment in personal life
- develop an action plan that relates personal interests, abilities and aptitudes to career opportunities and requirements
- use technology effectively to link and apply appropriate tools, management and processes to produce a desired outcome
- develop basic competencies (employability skills), by:
 - selecting relevant, goal-related activities, ranking them in order of importance, allocating necessary time, and preparing and following schedules (managing learning)
 - linking theory and practice, using resources, tools, technology and processes responsibly and efficiently (managing resources)
 - applying effective and innovative decision-making and problem-solving strategies in the design, production, marketing and consumption of goods and services (problem solving and innovation)
 - demonstrating appropriate written and verbal skills, such as composition, summarization and presentation (communicating effectively)
 - participating as a team member by working cooperatively with others and contributing to the group with ideas, suggestions and effort (working with others)

- maintaining high standards of ethics, diligence, attendance and punctuality, following safe procedures consistently, and recognizing and eliminating potential hazards (demonstrating responsibility).

PROGRAM ORGANIZATION

CURRICULUM STRUCTURE

Career and Technology Studies is organized into **strands** and **courses**.

Strands in CTS define competencies that help students:

- build daily living skills
- investigate career options
- use technology (managing, processes, tools) effectively and efficiently
- prepare for entry into the workplace and/or related post-secondary programs.

In general, strands relate to selected industry sectors offering positive occupational opportunities for students. Some occupational opportunities require further education after high school, and some allow direct entry into the workplace. Industry sectors encompass goods-producing industries, such as agriculture, manufacturing and construction; and service-producing industries, such as business, health, finance and insurance.

Courses are the building blocks for each strand. They define what a student is expected to know and be able to do (exit-level *competencies*). Courses also specify prerequisites. Recommendations for course parameters, such as instructional qualifications, facilities and equipment can be found in the guides to implementation.

The competencies a student must demonstrate to achieve success in a course are defined through *general outcomes*. Senior high school students who can demonstrate the general outcomes defined for a CTS course; i.e., who have the designated competencies, will qualify for 1 credit toward their high school diploma.

Specific outcomes provide a more detailed framework for instruction. Within the context of the general outcomes, the specific outcomes further define the knowledge, skills and attitudes the student should acquire.

The following chart shows the 22 strands that comprise the CTS program and the number of 1-credit courses available in each strand.

Strand	No. of Courses
1. Agriculture	33
2. Career Transitions	30
3. Communication Technology	33
4. Community Health	31
5. Construction Technologies	46
6. Cosmetology Studies	58
7. Design Studies	31
8. Electro-Technologies	47
9. Energy and Mines	26
10. Enterprise and Innovation	8
11. Fabrication Studies	44
12. Fashion Studies	29
13. Financial Management	16
14. Foods	37
15. Forestry	21
16. Information Processing	53
17. Legal Studies	13
18. Logistics	12
19. Management and Marketing	23
20. Mechanics	54
21. Tourism Studies	24
22. Wildlife	17

LEVELS OF ACHIEVEMENT

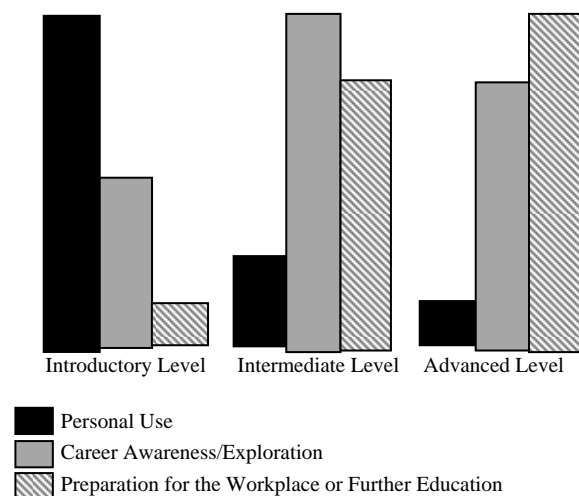
Courses are organized into three levels of achievement: **introductory**, **intermediate** and **advanced**. As students progress through the levels, they will be expected to meet higher standards and demonstrate an increased degree of competence, in both the program outcomes and the general outcomes defined for individual courses.

Introductory level courses help students build daily living skills and form the basis for further learning. Introductory courses are for students who have no previous experience in the strand.

Intermediate level courses build on the competencies developed at the introductory level. They provide a broader perspective, helping students recognize the wide range of related career opportunities available within the strand.

Advanced level courses refine expertise and help prepare students for entry into the workplace or a related post-secondary program.

The graph below illustrates the relative emphasis on the aspects of career planning at each of the levels.



CURRICULUM AND ASSESSMENT STANDARDS

Curriculum standards in CTS define what students must know and be able to do. Curriculum standards are expressed through the program outcomes for CTS, and through general and specific outcomes defined for individual courses within each strand.

Assessment standards define how student performance is to be judged. In CTS, each assessment standard defines the conditions and criteria to be used for assessing the competencies associated with each general outcome. To receive credit for a course, students must demonstrate competency at the level specified by the conditions and criteria defined for each general outcome.

Students throughout the province receive a fair and reliable assessment as they use the standards to guide their efforts, thus ensuring they participate more effectively and successfully in the learning and assessment process. Standards at advanced levels are, as much as possible, linked to workplace and post-secondary entry-level requirements.

TYPES OF COMPETENCIES

Two types of competencies are defined within the CTS program: basic and career-specific.

Basic competencies are generic to any career area and are developed within each course. Basic competencies include:

- personal management; e.g., managing learning, being innovative, ethics, managing resources
- social; e.g., communication, teamwork, leadership and service, demonstrating responsibility (safety and accountability).

Career-specific competencies relate to a particular strand. These competencies build daily living skills at the introductory levels and support the smooth transition to the workplace and/or post-secondary programs at the intermediate and advanced levels.

The model below shows the relationship of the two types of competencies within the 22 strands of the CTS program.












BASIC COMPETENCIES REFERENCE GUIDE

The chart below outlines basic competencies that students endeavour to develop and enhance in each of the CTS strands and courses. Students' basic competencies should be assessed through observations involving the student, teacher(s), peers and others as they complete the requirements for each course. In general, there is a progression of task complexity and student initiative as outlined in the Developmental Framework★. **As students progress through Stages 1, 2, 3 and 4 of this reference guide, they build on the competencies gained in earlier stages.** Students leaving high school should set themselves a goal of being able to demonstrate Stage 3 performance.

Suggested strategies for classroom use include:

- having students rate themselves and each other
- using in reflective conversation between teacher and student
- highlighting areas of strength
- tracking growth in various CTS strands
- highlighting areas upon which to focus
- maintaining a student portfolio.

Stage 1— <i>The student:</i>	Stage 2— <i>The student:</i>	Stage 3— <i>The student:</i>	Stage 4— <i>The student:</i>
<p>Managing Learning</p> <ul style="list-style-type: none"> <input type="checkbox"/> comes to class prepared for learning <input type="checkbox"/> follows basic instructions, as directed <input type="checkbox"/> acquires specialized knowledge, skills and attitudes <input type="checkbox"/> identifies criteria for evaluating choices and making decisions <input type="checkbox"/> uses a variety of learning strategies 	<p><input type="checkbox"/> </p> <ul style="list-style-type: none"> <input type="checkbox"/> follows instructions, with limited direction <input type="checkbox"/> sets goals and establishes steps to achieve them, with direction <input type="checkbox"/> applies specialized knowledge, skills and attitudes in practical situations <input type="checkbox"/> identifies and applies a range of effective strategies for solving problems and making decisions <input type="checkbox"/> explores and uses a variety of learning strategies, with limited direction 	<p><input type="checkbox"/> </p> <ul style="list-style-type: none"> <input type="checkbox"/> follows detailed instructions on an independent basis <input type="checkbox"/> sets clear goals and establishes steps to achieve them <input type="checkbox"/> transfers and applies specialized knowledge, skills and attitudes in a variety of situations <input type="checkbox"/> uses a range of critical thinking skills to evaluate situations, solve problems and make decisions <input type="checkbox"/> selects and uses effective learning strategies <input type="checkbox"/> cooperates with others in the effective use of learning strategies 	<p><input type="checkbox"/> </p> <p><input type="checkbox"/> </p> <ul style="list-style-type: none"> <input type="checkbox"/> demonstrates self-direction in learning, goal setting and goal achievement <input type="checkbox"/> transfers and applies learning in new situations; demonstrates commitment to lifelong learning <input type="checkbox"/> thinks critically and acts logically to evaluate situations, solve problems and make decisions <input type="checkbox"/> <input type="checkbox"/> provides leadership in the effective use of learning strategies
<p>Managing Resources</p> <ul style="list-style-type: none"> <input type="checkbox"/> adheres to established timelines; uses time/schedules/planners effectively <input type="checkbox"/> uses information (material and human resources), as directed <input type="checkbox"/> uses technology (facilities, equipment, supplies), as directed, to perform a task or provide a service <input type="checkbox"/> maintains, stores and/or disposes of equipment and materials, as directed 	<ul style="list-style-type: none"> <input type="checkbox"/> creates and adheres to timelines, with limited direction; uses time/schedules/planners effectively <input type="checkbox"/> accesses and uses a range of relevant information (material and human resources), with limited direction <input type="checkbox"/> uses technology (facilities, equipment, supplies), as appropriate, to perform a task or provide a service, with minimal assistance and supervision <input type="checkbox"/> maintains, stores and/or disposes of equipment and materials, with limited assistance 	<ul style="list-style-type: none"> <input type="checkbox"/> creates and adheres to detailed timelines on an independent basis; prioritizes task; uses time/schedules/planners effectively <input type="checkbox"/> accesses a range of information (material and human resources), and recognizes when additional resources are required <input type="checkbox"/> selects and uses appropriate technology (facilities, equipment, supplies) to perform a task or provide a service on an independent basis <input type="checkbox"/> maintains, stores and/or disposes of equipment and materials on an independent basis 	<ul style="list-style-type: none"> <input type="checkbox"/> creates and adheres to detailed timelines; uses time/schedules/planners effectively; prioritizes tasks on a consistent basis <input type="checkbox"/> uses a wide range of information (material and human resources) in order to support and enhance the basic requirement <input type="checkbox"/> recognizes the monetary and intrinsic value of managing technology (facilities, equipment, supplies) <input type="checkbox"/> demonstrates effective techniques for managing facilities, equipment and supplies
<p>Problem Solving and Innovation</p> <ul style="list-style-type: none"> <input type="checkbox"/> participates in problem solving as a process <input type="checkbox"/> learns a range of problem-solving skills and approaches <input type="checkbox"/> practices problem-solving skills by responding appropriately to a clearly defined problem, specified goals and constraints, by: <ul style="list-style-type: none"> – generating alternatives – evaluating alternatives – selecting appropriate alternative(s) – taking action 	<ul style="list-style-type: none"> <input type="checkbox"/> identifies the problem and selects an appropriate problem-solving approach, responding appropriately to specified goals and constraints <input type="checkbox"/> applies problem-solving skills to a directed or a self-directed activity, by: <ul style="list-style-type: none"> – generating alternatives – evaluating alternatives – selecting appropriate alternative(s) – taking action 	<ul style="list-style-type: none"> <input type="checkbox"/> thinks critically and acts logically in the context of problem solving <input type="checkbox"/> transfers problem-solving skills to real-life situations, by generating new possibilities <input type="checkbox"/> prepares implementation plans <input type="checkbox"/> recognizes risks 	<ul style="list-style-type: none"> <input type="checkbox"/> identifies and resolves problems efficiently and effectively <input type="checkbox"/> identifies and suggests new ideas to get the job done creatively, by: <ul style="list-style-type: none"> – combining ideas or information in new ways – making connections among seemingly unrelated ideas – seeking out opportunities in an active manner

Stage 1— <i>The student:</i>	Stage 2— <i>The student:</i>	Stage 3— <i>The student:</i>	Stage 4— <i>The student:</i>
<p>Communicating Effectively</p> <ul style="list-style-type: none"> <input type="checkbox"/> uses communication skills; e.g., reading, writing, illustrating, speaking <input type="checkbox"/> uses language in appropriate context <input type="checkbox"/> listens to understand and learn <input type="checkbox"/> demonstrates positive interpersonal skills in selected contexts 	<ul style="list-style-type: none"> <input type="checkbox"/> communicates thoughts, feelings and ideas to justify or challenge a position, using written, oral and/or visual means <input type="checkbox"/> uses technical language appropriately <input type="checkbox"/> listens and responds to understand and learn <input type="checkbox"/> demonstrates positive interpersonal skills in many contexts 	<ul style="list-style-type: none"> <input type="checkbox"/> prepares and effectively presents accurate, concise, written, visual and/or oral reports providing reasoned arguments <input type="checkbox"/> encourages, persuades, convinces or otherwise motivates individuals <input type="checkbox"/> listens and responds to understand, learn and teach <input type="checkbox"/> demonstrates positive interpersonal skills in most contexts 	<ul style="list-style-type: none"> <input type="checkbox"/> negotiates effectively, by working toward an agreement that may involve exchanging specific resources or resolving divergent interests <input type="checkbox"/> negotiates and works toward a consensus <input type="checkbox"/> listens and responds to understand, learn, teach and evaluate <input type="checkbox"/> promotes positive interpersonal skills among others
<p>Working with Others</p> <ul style="list-style-type: none"> <input type="checkbox"/> fulfills responsibility in a group project <input type="checkbox"/> works collaboratively in structured situations with peer members <input type="checkbox"/> acknowledges the opinions and contributions of others in the group 	<ul style="list-style-type: none"> <input type="checkbox"/>  <input type="checkbox"/> cooperates to achieve group results <input type="checkbox"/> maintains a balance between speaking, listening and responding in group discussions <input type="checkbox"/> respects the feelings and views of others 	<ul style="list-style-type: none"> <input type="checkbox"/> seeks a team approach, as appropriate, based on group needs and benefits; e.g., idea potential, variety of strengths, sharing of workload <input type="checkbox"/> works in a team or group: <ul style="list-style-type: none"> – encourages and supports team members – helps others in a positive manner – provides leadership/followership as required – negotiates and works toward consensus as required 	<ul style="list-style-type: none"> <input type="checkbox"/> leads, where appropriate, mobilizing the group for high performance <input type="checkbox"/> understands and works within the context of the group <input type="checkbox"/> prepares, validates and implements plans that reveal new possibilities
<p>Demonstrating Responsibility</p> <p>Attendance</p> <ul style="list-style-type: none"> <input type="checkbox"/> demonstrates responsibility in attendance, punctuality and task completion <p>Safety</p> <ul style="list-style-type: none"> <input type="checkbox"/> follows personal and environmental health and safety procedures <input type="checkbox"/> identifies immediate hazards and their impact on self, others and the environment <input type="checkbox"/> follows appropriate/emergency response procedures <p>Ethics</p> <ul style="list-style-type: none"> <input type="checkbox"/> makes personal judgements about whether or not certain behaviours/actions are right or wrong 	<ul style="list-style-type: none"> <input type="checkbox"/>  <input type="checkbox"/> recognizes and follows personal and environmental health and safety procedures <input type="checkbox"/> identifies immediate and potential hazards and their impact on self, others and the environment <input type="checkbox"/>  <input type="checkbox"/> assesses how personal judgements affect other peer members and/or family; e.g., home and school 	<ul style="list-style-type: none"> <input type="checkbox"/>  <input type="checkbox"/> establishes and follows personal and environmental health and safety procedures <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/> assesses the implications of personal/group actions within the broader community; e.g., workplace 	<ul style="list-style-type: none"> <input type="checkbox"/>  <input type="checkbox"/> transfers and applies personal and environmental health and safety procedures to a variety of environments and situations <input type="checkbox"/>  <input type="checkbox"/>  <input type="checkbox"/> demonstrates accountability for actions taken to address immediate and potential hazards <input type="checkbox"/> analyzes the implications of personal/group actions within the global context <input type="checkbox"/> states and defends a personal code of ethics as required
<p>★Developmental Framework</p> <ul style="list-style-type: none"> • <i>Simple task</i> • <i>Structured environment</i> • <i>Directed learning</i> 	<ul style="list-style-type: none"> • <i>Task with limited variables</i> • <i>Less structured environment</i> • <i>Limited direction</i> 	<ul style="list-style-type: none"> • <i>Task with multiple variables</i> • <i>Flexible environment</i> • <i>Self-directed learning, seeking assistance as required</i> 	<ul style="list-style-type: none"> • <i>Complex task</i> • <i>Open environment</i> • <i>Self-directed/self-motivated</i>

CONSTRUCTION TECHNOLOGIES

B. STRAND RATIONALE AND PHILOSOPHY

The products of construction and manufacturing are a reflection of the needs and wants of society. For centuries, people have built structures and made objects to provide protection from the elements, to make work easier and to make life more enjoyable.

Today, our social and economic well-being is still closely linked to our ability to transform materials into useful products. Therefore, it is important that as students prepare for their futures, they should understand how the construction and manufacturing industries organize themselves and apply technology in productive ways.

In Alberta, the construction and manufacturing sectors of the economy are characterized by relatively small entrepreneurial businesses that make products for domestic and foreign market needs.

In recent years, dramatic changes have occurred in the way buildings and other products have been designed and built. With the aid of new techniques, architects and engineers are now able to simulate and evaluate designs with extreme accuracy. This precision translates into stronger structures, smaller tolerances, less waste and the need for a highly trained and flexible work force.

Construction Technologies, a strand in Career and Technology Studies, has been developed to help

meet this educational need. Students selecting modules from this strand have the opportunity to investigate and develop important knowledge, skills and attitudes relative to the design, construction and maintenance of buildings and other related products.

Students are provided with a broad base of relevant theory and practice that builds daily-living and career-specific skills. Successful completion of modules in this strand is intended to provide students with the skills and experience required for entry-level employment or for pursuing post-secondary education. This preparation is accomplished by encouraging students to:

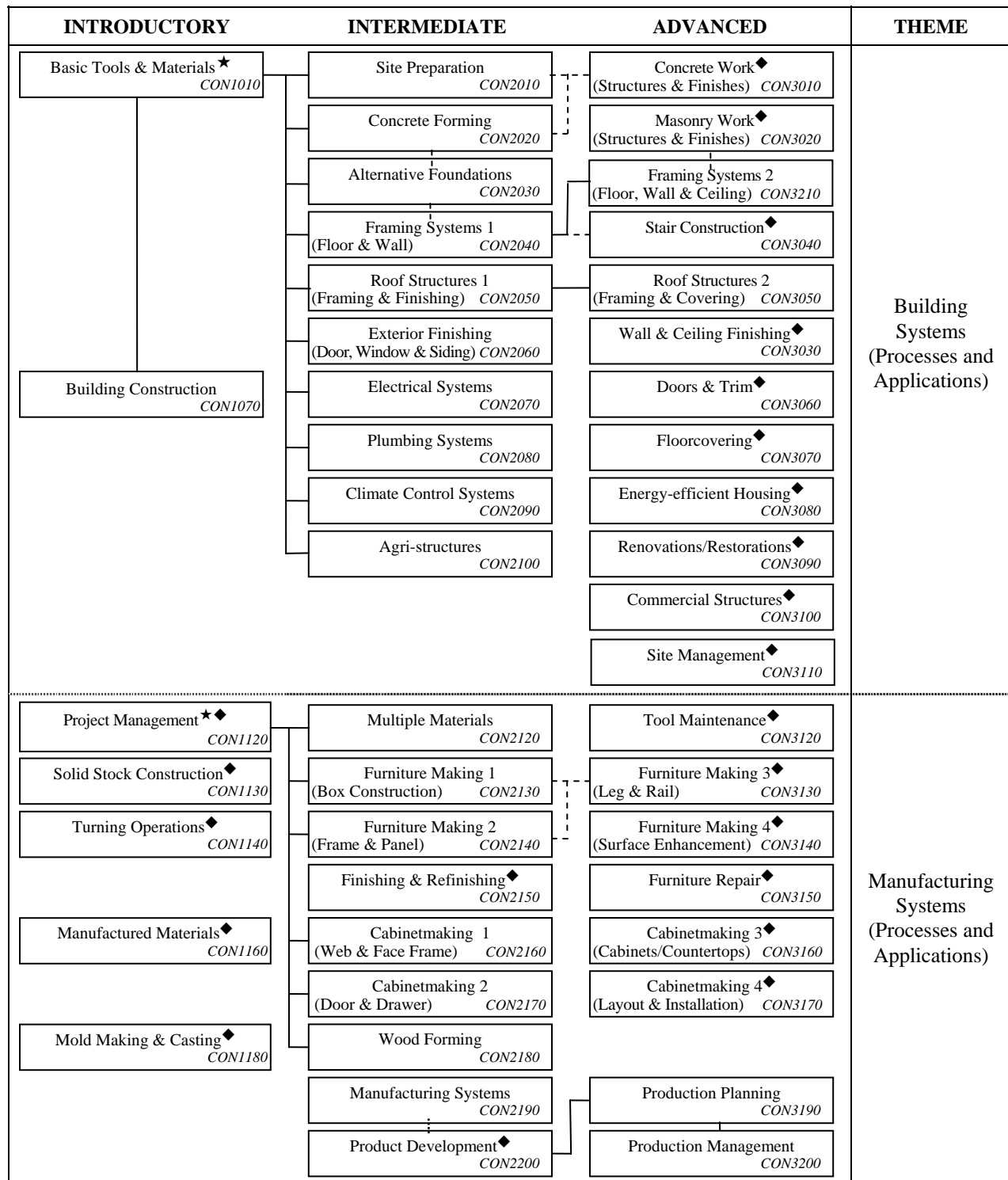
- develop safe work and environmental practices
- develop self and resource management skills
- work with a variety of technologies and technological systems
- communicate and work as effective team members
- develop ethical work habits and relationships
- creatively seek practical solutions to problems

- develop consumer and life skills
- identify further educational and career opportunities.

Within the philosophy of Career and Technology Studies, *students* in Construction Technologies *will*:

- appreciate the importance of the construction and manufacturing industries in relationship to our personal, social and economic well-being
- demonstrate a working knowledge of materials, tools and processes that are used to create buildings and other related products that meet the needs and wants of society
- apply effective and responsible decision-making skills in the design and construction of buildings and durable goods
- develop positive attitudes toward individual and team work responsibilities, quality production and service
- develop an appreciation for health, safety and environmental issues related to construction and manufacturing
- appreciate the need for legislation and codes that regulate building construction and manufacturing activities
- link, in meaningful and practical ways, the knowledge, skills and attitudes developed in other strands and courses to this strand
- assess personal interests and abilities related to making realistic career choices.

SCOPE AND SEQUENCE



—— Prerequisite

----- Recommended sequence

★ Course provides a strong foundation for further learning in this strand.

♦ Refer to specific courses for additional prerequisites.

MODULE LEARNER EXPECTATIONS: INTRODUCTORY LEVEL

MODULE CON1010: BASIC TOOLS & MATERIALS

Level: Introductory

Theme: Building Systems (Processes and Applications)

Prerequisite: None

Module Description: Students develop basic hand tool and production skills to transform, safely, common building materials into useful products.

Module Learner Expectations: *The student will:*

- identify and describe the safe use of basic hand tools
- identify and compare the properties of common materials used in construction and fabrication activities
- apply construction/fabrication processes and skills to produce a product
- demonstrate basic competencies.

MODULE CON1070: BUILDING CONSTRUCTION

Level: Introductory

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

Module Description: Students examine common building systems, and develop basic skills related to building a simple model or full size system/structure.

Module Learner Expectations: *The student will:*

- identify and describe the main systems found in a residential structure
- list and describe the basic materials and hand tools used in building construction
- apply basic construction techniques to build a simple scale model or full size structure/system
- profile a trade or occupation within the building construction industry
- demonstrate basic competencies.

MODULE CON1120: PROJECT MANAGEMENT

Level: Introductory

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

Module Description: Students develop basic shop drawing and estimating skills, and apply them to build a product.

Module Learner Expectations: *The student will:*

- identify and describe the parts of a technological system
- apply basic drawing skills to prepare a shop drawing
- prepare a project timeline, cost estimate and work schedule
- apply the use of a technological system to construct a simple product with multiple parts
- demonstrate basic competencies.

MODULE CON1130: SOLID STOCK CONSTRUCTION

Level: Introductory

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

Module Description: Students develop basic hand and power tool skills to build a product made from solid wood.

Module Learner Expectations: *The student will:*

- identify and describe the physical characteristics of a variety of hard and soft woods
- apply basic drawing and transfer skills to prepare a pattern or template
- construct a wooden product, using basic joinery techniques
- demonstrate basic competencies.

MODULE CON1140: TURNING OPERATIONS

Level: Introductory

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

Module Description: Students use wood-turning equipment and techniques to create a faceplate and spindle turning made from solid and/or built-up stock.

Module Learner Expectations: *The student will:*

- operate, safely, a power wood lathe
- apply drawing and transfer skills to prepare a full size pattern or template
- produce a faceplate and spindle turning, using solid or built-up stock
- demonstrate basic competencies.

MODULE CON1160: MANUFACTURED MATERIALS

Level: Introductory

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

Module Description: Students select and use the appropriate materials and tools to build a product or structure from a wood composite or other manufactured material.

Module Learner Expectations: *The student will:*

- identify and describe the characteristics of common manufactured materials
- demonstrate the safe use of a given hand and power tool
- create a product from a manufactured material, using basic joinery techniques
- demonstrate basic competencies.

MODULE CON1180: MOLD MAKING & CASTING

Level: Introductory

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

Module Description: Students apply knowledge of casting and molding materials and processes to prepare a mold and produce a casting.

Module Learner Expectations: *The student will:*

- list and describe common materials and processes used in casting/molding
- apply principles of pattern making to create a simple mold
- cast and finish a product, using the appropriate skills, materials and processes
- demonstrate basic competencies.

GENERAL OUTCOMES: INTERMEDIATE LEVEL

COURSE CON2010: SITE PREPARATION

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

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

General Outcomes: *The student will:*

- identify and describe typical building site layout and excavation processes
- complete an application for a building permit
- apply site preparation skills to assist in the location of building site lines and features
- demonstrate basic competencies.

COURSE CON2020: CONCRETE FORMING

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

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

General Outcomes: *The student will:*

- list and describe factors that affect footing and wall design
- identify and describe common forming materials and processes
- apply concrete forming skills to assist in forming and placing a concrete foundation
- demonstrate basic competencies.

COURSE CON2030: ALTERNATIVE FOUNDATIONS

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

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

General Outcomes: *The student will:*

- identify and describe the components of an alternative foundation system
- identify the health hazards and precautions related to the use of engineered materials
- apply construction skills to assist in the design/construction of an alternative foundation system
- demonstrate basic competencies.

COURSE CON2040: FRAMING SYSTEMS 1 (FLOOR & WALL)

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

Description: Students develop basic framing knowledge and skills associated with the construction of a floor and wall system.

General Outcomes: *The student will:*

- identify and describe the parts of a floor and wall framing system
- read and interpret the appropriate drawings and specifications to create a floor and wall framing and sheathing estimate
- apply framing skills to assist in the layout and construction of floor and wall components
- demonstrate basic competencies.

COURSE CON2050: ROOF STRUCTURES 1 (FRAMING & FINISHING)

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

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

General Outcomes: *The student will:*

- identify and describe the different styles and parts of a roof system
- read and interpret the appropriate drawings and specifications to create a roof framing and finishing estimate
- apply roofing skills to assist in the framing and finishing of a roof structure
- demonstrate basic competencies.

COURSE CON2060: EXTERIOR FINISHING (DOOR, WINDOW & SIDING)

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

Description: Students apply and develop basic knowledge of door, window and siding systems and installation skills and procedures.

General Outcomes: *The student will:*

- identify and describe common types of exterior doors, windows and siding materials
- read and interpret the appropriate drawings and specifications to create a door and window schedule and siding estimate
- apply finishing skills to install a prehung door, a window unit and siding materials
- demonstrate basic competencies.

COURSE CON2070: ELECTRICAL SYSTEMS

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

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

General Outcomes: *The student will:*

- list and describe the electrical systems and components associated with residential wiring
- apply wiring principles and code requirements to create a wiring diagram
- apply wiring skills to assist in the installation of a residential wiring system
- profile a trade or occupation within the electrical field
- demonstrate basic competencies.

COURSE CON2080: PLUMBING SYSTEMS

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

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

General Outcomes: *The student will:*

- identify and describe the parts of a residential plumbing system
- create a drawing of a water supply, drainage, waste and vent system for a typical plumbing fixture
- apply plumbing skills to assist in the installation of a water supply, waste and vent system
- profile a trade or occupation within the plumbing field
- demonstrate basic competencies.

COURSE CON2090: CLIMATE CONTROL SYSTEMS

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

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

General Outcomes: *The student will:*

- list and describe the major components of a typical heating, ventilating and air conditioning system
- prepare a preventive maintenance schedule for a heating, ventilating and/or air conditioning system
- service or install a heating, ventilating and/or air conditioning system
- profile a trade or occupation within the heating and air conditioning fields
- demonstrate basic competencies.

COURSE CON2100: AGRI-STRUCTURES

Level: Intermediate

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

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

General Outcomes: *The student will:*

- identify the major issues that must be addressed when designing an agri-structure
- read and interpret the appropriate drawings and specifications to create a material and cost estimate
- construct a structure for use in agriculture
- demonstrate basic competencies.

MODULE CON2120: MULTIPLE MATERIALS

Level: Intermediate

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1120 Project Management

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

Module Learner Expectations: *The student will:*

- identify advantages of using different materials in a product
- apply knowledge of structural materials, planning, and construction techniques to produce a product from different materials
- demonstrate basic competencies.

MODULE CON2130: FURNITURE MAKING 1 (BOX CONSTRUCTION)

Level: Intermediate

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1120 Project Management

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

Module Learner Expectations: *The student will:*

- identify and describe the design features and processes used to construct a box-type furniture product
- apply basic furniture-making skills to plan and construct a piece of furniture based on box construction techniques
- demonstrate basic competencies.

MODULE CON2140: FURNITURE MAKING 2 (FRAME & PANEL)

Level: Intermediate

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1120 Project Management

Module Description: Students use solid and/or composite materials to build a frame and panel product or component.

Module Learner Expectations: *The student will:*

- identify and describe the design features and processes used to construct a frame and panel product
- apply basic furniture-making skills to plan and construct a component or piece of furniture based on frame and panel construction techniques
- demonstrate basic competencies.

MODULE CON2150: FINISHING & REFINISHING

Level: Intermediate

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

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

Module Learner Expectations: *The student will:*

- identify common finishes and finishing/refinishing techniques
- identify and describe the health hazards and Workplace Hazardous Materials Information System (WHMIS) regulations associated with the products used in finishing/refinishing
- demonstrate appropriate finishing/refinishing techniques
- demonstrate basic competencies.

MODULE CON2160: CABINETMAKING 1 (WEB & FACE FRAME)

Level: Intermediate

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1120 Project Management

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

Module Learner Expectations: *The student will:*

- identify and describe the design features and processes used to construct a web and face frame product
- prepare a detailed material list and event sequence
- build a cabinet, using web and face frame construction techniques
- demonstrate basic competencies.

MODULE CON2170: CABINETMAKING 2 (DOOR & DRAWER)

Level: Intermediate

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1120 Project Management

Module Description: Students use solid and composite materials to develop skills in building cabinet doors and drawers.

Module Learner Expectations: *The student will:*

- identify and describe common methods of designing and constructing cabinet doors and drawers
- apply cabinetmaking skills to plan and construct door/drawer components
- profile a trade or occupation within the cabinetmaking field
- demonstrate basic competencies.

MODULE CON2180: WOOD FORMING

Level: Intermediate

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1120 Project Management

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

Module Learner Expectations: *The student will:*

- describe common wood forming techniques
- build or obtain the necessary molds and clamping devices to bend a piece of solid stock or wood laminate
- apply wood forming skills and techniques to make a product or component
- demonstrate basic competencies.

MODULE CON2190: MANUFACTURING SYSTEMS

Level: Intermediate

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: None

Module Description: Students investigate the nature of manufacturing systems used to produce durable goods.

Module Learner Expectations: *The student will:*

- describe current production systems used to manufacture durable goods
- identify the lines of communication and decision making in a typical production system
- explain how the production of durable goods is being altered by the effects of technology and the global economy
- demonstrate basic competencies.

MODULE CON2200: PRODUCT DEVELOPMENT

Level: Intermediate

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

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

Module Learner Expectations: *The student will:*

- list and describe the steps involved in developing a product for manufacturing
- apply designing and planning skills to assist in the development of a prototype
- describe the marketing and manufacturing potential of a product
- demonstrate basic competencies.

GENERAL OUTCOMES: ADVANCED LEVEL

COURSE CON3010: CONCRETE WORK (STRUCTURES & FINISHES)

Level: Advanced

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

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

General Outcomes: *The student will:*

- identify and describe concrete forming, placing and finishing techniques
- use the appropriate tools, materials and processes to form, reinforce, place and finish a concrete structure
- create a profile of a trade or occupation within the field of concrete work
- demonstrate basic competencies.

COURSE CON3020: MASONRY WORK (STRUCTURES & FINISHES)

Level: Advanced

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

Description: Students develop basic knowledge and skills related to masonry materials, structures and finishes.

General Outcomes: *The student will:*

- identify and describe common types of masonry materials and finishes
- read and interpret a working drawing to prepare a cost estimate of a masonry surface
- apply masonry skills to assist in the application of a masonry finish or in the construction of a masonry structure
- create a profile of a trade or occupation within the field of masonry work
- demonstrate basic competencies.

COURSE CON3030: WALL & CEILING FINISHING

Level: Advanced

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

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

General Outcomes: *The student will:*

- describe the procedures related to the installation of insulation and vapour barrier to an exterior wall and ceiling
- identify and describe the health hazards and safety precautions associated with the use of insulating, drywalling and finishing materials
- prepare, apply and finish a wall and ceiling surface
- demonstrate basic competencies.

COURSE CON3040: STAIR CONSTRUCTION

Level: Advanced

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

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

General Outcomes: *The student will:*

- identify and describe different stair types, component parts and construction techniques
- interpret building code regulations pertaining to residential stair design
- design, lay out and construct a straight flight of stairs
- demonstrate basic competencies.

COURSE CON3050: ROOF STRUCTURES 2 (FRAMING & COVERING)

Level: Advanced

Theme: Building Systems (Processes and Applications)

Prerequisite: CON2050 Roof Structures 1 (Framing & Finishing)

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

General Outcomes: *The student will:*

- identify and describe the design features of intersecting sloped roofs
- calculate the length of rafters, using ratio and proportion techniques
- lay out, cut and assemble a set of rafters for a roof assembly
- demonstrate basic competencies.

COURSE CON3060: DOORS & TRIM

Level: Advanced

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

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

General Outcomes: *The student will:*

- identify common types of doors, hardware and trim products
- install doors, moldings and other trim products
- create a profile of a trade or occupation within the finish carpentry field
- demonstrate basic competencies.

COURSE CON3070: FLOORCOVERING

Level: Advanced

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1010 Basic Tools & Materials

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

General Outcomes: *The student will:*

- identify and describe common types of residential, institutional and commercial floor coverings
- apply flooring skills to assist in the installation of a floor covering
- create a profile of a trade or occupation within the floor covering field
- demonstrate basic competencies.

COURSE CON3080: ENERGY-EFFICIENT HOUSING

Level: Advanced

Theme: Building Systems (Processes and Applications)

Prerequisite: CON1070 Building Construction

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

General Outcomes: *The student will:*

- identify and describe energy-efficient construction materials and techniques
- calculate the energy efficiency of a typical residence or commercial structure
- write a proposal outlining how to improve the energy efficiency of a given building
- demonstrate basic competencies.

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 Learner Expectations: *The student will:*

- complete a feasibility study and cost estimate of a renovation/restoration project
- apply construction skills to assist in a building renovation/restoration project, using traditional and modern construction materials and techniques
- demonstrate basic competencies.

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 Learner Expectations: *The student will:*

- compare the differences between residential, institutional and commercial construction
- describe common types of materials and construction techniques used in commercial construction
- demonstrate commercial construction job site expectations and skill requirements
- demonstrate basic competencies.

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 Learner Expectations: *The student will:*

- identify and describe the key elements of project management related to commercial and residential construction
- outline the roles and responsibilities of the principal players on a construction project
- apply site management theories and practices to create a management plan for a construction project
- demonstrate basic competencies.

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 Learner Expectations: *The student will:*

- identify and describe the essential elements and desired outcomes of a preventive maintenance program
- prepare a maintenance schedule for a piece of equipment
- apply established maintenance procedures to assess and maintain hand and power tools
- demonstrate basic competencies.

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 Learner *The student will:*

Expectations:

- identify and describe the design features and joinery techniques of a typical leg-and-rail piece of furniture
- apply drawing and estimating skills and techniques to prepare a shop drawing, detailed material list and cost estimate
- plan and build a piece of furniture, using leg-and-rail construction techniques
- demonstrate basic competencies.

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 Learner *The student will:*

Expectations:

- identify and describe methods of matching wood veneer
- differentiate between inlay, marquetry and carving techniques
- create a veneer, inlay or carving feature for a product or component
- demonstrate basic competencies.

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 Learner Expectations: *The student will:*

- assess the condition of a piece of furniture to determine whether it can be economically repaired or restored
- prepare a repair/restoration plan and cost estimate
- repair/restore a piece of furniture
- demonstrate basic competencies.

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 Learner Expectations: *The student will:*

- identify and describe common types of cabinets/countertops and installation procedures
- identify and describe a suitable edge treatment for a given application
- apply/install a given material to produce a suitable cabinet/countertop
- demonstrate basic competencies.

MODULE CON3170: CABINETMAKING 4 (LAYOUT & INSTALLATION)

Level: Advanced

Theme: Manufacturing Systems (Processes and Applications)

Prerequisite: CON1120 Project Management

Module Description: Students develop a floor/wall cabinet plan and order and install a set of prebuilt cabinets.

Module Learner Expectations: *The student will:*

- design a room layout and prepare a cabinet schedule
- lay out and install a set of cabinets and countertops
- create a profile of a trade or occupation within the cabinetmaking field
- demonstrate basic competencies.

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 Learner Expectations: *The student will:*

- identify the characteristics of an efficient production system
- analyze a product to determine the necessary production processes and tools
- create a production flow chart and/or facility layout
- demonstrate basic competencies.

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 Learner Expectations: *The student will:*

- describe effective production management strategies
- develop a system to manage and schedule work and to control materials and completed products
- use effective management skills to operate an efficient production system
- demonstrate basic competencies.

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 Learner Expectations: *The student will:*

- compare conventional and engineered framing systems and components
- 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
- demonstrate advanced framing, layout and assembly skills
- demonstrate basic competencies.