

COURSE CON2010: SITE PREPARATION

Level: Intermediate

Prerequisite: CON1070: Building Construction

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

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

Outcomes: The student will:

- 1. identify and describe a typical building site layout and excavation processes**
 - 1.1 describe a typical method of establishing lot and building lines as well as grade levels
 - 1.2 explain the use of a plumb bob, builder's level and transit and string line
 - 1.3 use a site plan and elevation drawings to determine the amount of soil to be excavated
- 2. complete an application for a building permit**
 - 2.1 explain the purpose of local, provincial and national building regulations
 - 2.2 identify local zoning regulations that limit the type, size and location of new buildings
 - 2.3 identify the parameters for selecting a building site
 - 2.4 identify the information that is needed to complete an application for a building permit
- 3. apply site preparation skills to assist in the location of building site lines and features**
 - 3.1 locate and mark all underground and overhead services
 - 3.2 identify soil conditions that may require shoring
 - 3.3 use an approved method to:
 - 3.3.1 position batterboards
 - 3.3.2 locate lot and building lines
 - 3.3.3 excavate
 - 3.3.4 establish locations and elevations for wall and pier footings
- 4. demonstrate basic competencies**
 - 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems
 - 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely
 - 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. identify possible life roles related to the skills and content of this cluster**
 - 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2020: CONCRETE FORMING

Level: Intermediate

Prerequisite: CON1010: Construction Tools & Materials

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

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

Supporting Courses: CON1070: Building Construction
CON2010: Site Preparation

Outcomes: The student will:

- 1. list and describe factors that affect footing and wall design**
 - 1.1 describe how soils are tested for:
 - 1.1.1 resistance to penetration
 - 1.1.2 shear resistance
 - 1.1.3 moisture content
 - 1.2 explain how soil, water and frost conditions affect the design and construction of a foundation as well as excavation and safety procedures
- 2. identify and describe common forming materials and processes**
 - 2.1 explain the purpose of a footing
 - 2.2 describe one or more common techniques to form footings, walls and piers
 - 2.3 describe methods of reinforcing a footing and wall section
 - 2.4 identify the parts of a typical concrete wall form
 - 2.5 explain the difference between box-sill and cast-in-place construction
 - 2.6 identify release agents and coatings used on forms
 - 2.7 describe types of cement and concrete mixers used in footing and wall systems
 - 2.8 describe factors that determine the size and strength of a footing and wall components
- 3. apply concrete forming skills to assist in forming and placing a concrete foundation**
 - 3.1 prepare a detailed list of materials and supplies to form a footing and wall
 - 3.2 calculate the volume of concrete required for a footing and wall component
 - 3.3 use the appropriate tools and materials to:
 - 3.3.1 construct a set of forms for a rectangular footing and wall section
 - 3.3.2 square level, align and brace
 - 3.3.3 place, consolidate and finish a concrete footing and wall section
 - 3.3.4 make provisions to attach a sill plate, if necessary
 - 3.3.5 seal walls below ground level and install weeping tile
 - 3.3.6 backfill, taking into account lateral pressure
- 4. demonstrate basic competencies**
 - 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems

- 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely
- 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. identify possible life roles related to the skills and content of this cluster**
 - 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2030: ALTERNATIVE FOUNDATIONS

Level: Intermediate

Prerequisite: CON1010: Construction Tools & Materials

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

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

Supporting Courses: CON1070: Building Construction
CON2020: Concrete Forming

Outcomes: The student will:

1. identify and describe the components of an alternative foundation system

- 1.1 describe alternative foundation systems and materials including:
 - 1.1.1 concrete masonry block
 - 1.1.2 preserved wood
 - 1.1.3 foam form
- 1.2 label and describe the parts of a typical preserved wood, masonry block and/or foam form foundation
- 1.3 list and describe the factors that determine the design and construction of a footing and wall section for one or more alternative systems
- 1.4 describe levelling and plumbing techniques that are used with a particular foundation system
- 1.5 describe recommended methods that are used to control drainage and damp proof an alternative foundation system
- 1.6 describe the flooring options that can be used with an alternative foundation system

2. identify the health hazards and precautions related to the use of engineered materials

- 2.1 identify local building codes that pertain to the design and construction of alternative foundation systems
- 2.2 identify suitable personal protective equipment and recommended procedures related to the use of alternative materials
- 2.3 describe suitable methods used to dispose of scrap materials

3. apply construction skills to assist in the design/construction of an alternative foundation system

- 3.1 prepare a sketch of an alternative foundation that identifies construction details, size and spacing of components, as well as sealing, drainage and damp proofing features
- 3.2 use the appropriate tools, materials and processes to:
 - 3.2.1 level the footings and create the necessary drainage system
 - 3.2.2 lay out and assemble the wall section
 - 3.2.3 seal joints and apply a vapour seal/damp proofing
 - 3.2.4 backfill without damaging the moisture barrier

4. demonstrate basic competencies

- 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems

- 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely
- 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. identify possible life roles related to the skills and content of this cluster**
 - 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 5.2 identify potential resources to minimize barriers and maximize opportunities

- 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. identify possible life roles related to the skills and content of this cluster**
 - 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2045: FRAMING SYSTEMS – WALL

Level: Intermediate

Prerequisite: CON1010: Construction Tools & Materials

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

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

Supporting Course: CON1070: Building Construction

Outcomes: The student will:

1. identify and describe the parts of a wall framing system

- 1.1 describe common wood defects associated with natural growth and milling operations
- 1.2 compare the span limitations of different species and grades of lumber and manufactured components
- 1.3 identify common types of sheathing materials
- 1.4 identify the adhesives and fasteners used in conjunction with wall framing
- 1.5 identify the parts and purpose of a typical wall framing system
- 1.6 compare platform framing to post and beam construction
- 1.7 describe the components of an engineered wall system

2. read and interpret the appropriate drawings and specifications to create a wall framing and sheathing estimate

- 2.1 use a frame structure drawing to determine the location, type and sizes of sills and headers, as well as sheathing requirements
- 2.2 use a wall frame elevation to determine the size and locations of studs, headers and rough opening sizes
- 2.3 prepare a quantity takeoff for a wall section

3. apply framing skills to assist in the layout and construction of wall components

- 3.1 identify and describe the proper use of portable electric and air-activated tools
- 3.2 demonstrate proper methods of lifting materials and components
- 3.3 use proper personal protective equipment
- 3.4 cover openings and build railings, where needed
- 3.5 use the appropriate hand tools and portable equipment to:
 - 3.5.1 lay out components
 - 3.5.2 cut materials for wall sections
 - 3.5.3 lay out and assemble a wall section
 - 3.5.4 square floor and wall components
 - 3.5.5 install sheathing
 - 3.5.6 erect, plumb and brace wall sections

4. demonstrate basic competencies

- 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems

- 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely
- 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. identify possible life roles related to the skills and content of this cluster**
 - 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2050: ROOF STRUCTURES 1

Level: Intermediate

Prerequisite: CON1010: Construction Tools & Materials

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

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

Supporting Course: CON1070: Building Construction

Outcomes: The student will:

1. identify and describe the different styles and parts of a roof system

- 1.1 list and describe the common styles of roofs
- 1.2 define roof terms such as span, run, rise, slope and overhang
- 1.3 describe the parts of a common rafter
- 1.4 describe the parts of a typical roof truss
- 1.5 describe the advantages of using roof trusses versus standard common rafters
- 1.6 list and describe the parts of a boxed cornice
- 1.7 identify sheathing grades and types, and joint and nailing patterns
- 1.8 list and describe the types of roof finishes

2. read and interpret the appropriate drawings and specifications to create a roof framing and finishing estimate

- 2.1 make a roof sketch indicating the location of roof trusses, lookout rafters, bridging, fascia headers, boxed cornices and sheathing patterns
- 2.2 prepare a materials list specifying:
 - 2.2.1 the size, slope and number of roof trusses or common rafters
 - 2.2.2 thickness and quantities of sheathing
 - 2.2.3 quantities of H-clips and metal anchors
 - 2.2.4 style, colour, weight and quantities of asphalt shingles

3. apply roofing skills to assist in the framing and finishing of a roof structure

- 3.1 check condition of ladders before using and observe safe angle ratios
- 3.2 use proper foot and head protection
- 3.3 identify hazards associated with wet or frosty conditions on sloped surfaces
- 3.4 identify safety devices that are used in conjunction with roof construction
- 3.5 use the appropriate tools and equipment to:
 - 3.5.1 locate, fasten, square and plumb roof trusses
 - 3.5.2 cut and install common rafters
- 3.6 install lookouts, fascia and braces
- 3.7 apply sheathing and shingling

4. demonstrate basic competencies

- 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems

- 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely
- 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. identify possible life roles related to the skills and content of this cluster**
 - 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2060: DOORS, WINDOWS & SIDING

Level: Intermediate

Prerequisite: CON1010: Construction Tools & Materials

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

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

Supporting Course: CON1070: Building Construction

Outcomes: The student will:

- 1. identify and describe common types of exterior doors, windows and siding materials**
 - 1.1 list and describe common types of exterior doors and windows
 - 1.2 identify methods of sizing windows and exterior doors
 - 1.3 describe the procedures used to install an exterior door and a window
 - 1.4 list and describe the components used in conjunction with the installation of vinyl and aluminum siding
 - 1.5 describe the purpose and use of building papers and other housewrap materials
- 2. read and interpret the appropriate drawings and specifications to create a door and window schedule and siding estimate**
 - 2.1 use elevation drawings and specifications to develop a door and window schedule
 - 2.2 use an elevation drawing to identify the types of siding and cornice materials and estimated amounts
- 3. apply finishing skills to install a prehung door, a window unit and siding materials**
 - 3.1 use the appropriate tools and processes to:
 - 3.1.1 level, plumb, seal and fasten a prefabricated door and a window unit
 - 3.1.2 install exterior finishes
 - 3.1.3 check and secure all scaffolding
 - 3.1.4 observe proper handling and lifting procedures
 - 3.1.5 use appropriate eye and ear protection
- 4. demonstrate basic competencies**
 - 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems
 - 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely

- 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. identify possible life roles related to the skills and content of this cluster**
 - 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2070: ELECTRICAL SYSTEMS

Level: Intermediate

Prerequisite: CON1010: Construction Tools & Materials

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

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

Supporting Course: CON1070: Building Construction

Outcomes: The student will:

- 1. list and describe the electrical systems and components associated with residential wiring**
 - 1.1 identify the principal hazards associated with electrical work; e.g., shocks, burns, fire, falls
 - 1.2 outline methods that are commonly used to prevent contact with a live electric circuit
 - 1.3 identify the nonconducting extinguishing agents that can be used with electrical fires
 - 1.4 describe and provide examples of:
 - 1.4.1 alternating and direct current
 - 1.4.2 series and parallel circuits
 - 1.5 define the terms and explain the relationships between voltage, amperage and resistance in a typical circuit
 - 1.6 identify the common types of electrical systems found in a modern home such as lighting, utility, heating, communication and alarm systems
 - 1.7 describe the symbols that are used to indicate a wall plug, light fixture, range, dryer plug, etc., on an electrical drawing
 - 1.8 identify the code requirements for installing outlets in a kitchen, bathroom, living room and bedroom
 - 1.9 list and describe the types of conductors and connection devices that are used in conventional construction
 - 1.10 identify design and framing requirements when installing electrical fixtures and wires
- 2. apply wiring principles and code requirements to create a wiring diagram**
 - 2.1 make a wiring diagram for a typical residential wiring project
 - 2.2 prepare a list of materials for a wiring project
 - 2.3 complete an application for a wiring permit
- 3. apply wiring skills to assist in the installation of a residential wiring system**
 - 3.1 use the appropriate tools and materials to frame and install a typical residential wiring circuit including:
 - 3.1.1 general purpose and split receptacle
 - 3.1.2 single-pole and three-way switch
 - 3.1.3 ceiling fixture
 - 3.1.4 outside outlet
 - 3.1.5 service panel
 - 3.2 test a circuit for power, grounding and continuity

4. demonstrate basic competencies

- 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems
- 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely
- 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks

5. identify possible life roles related to the skills and content of this cluster

- 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
- 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2080: PLUMBING SYSTEMS

Level: Intermediate

Prerequisite: CON1010: Construction Tools & Materials

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

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

Supporting Course: CON1070: Building Construction

Outcomes: The student will:

1. identify and describe the parts of a residential plumbing system

- 1.1 identify and describe the piping systems in a conventional residence such as water supply, vent, drainage and gas supply
- 1.2 examine the principles related to proper sizing, venting, pressures and drainage angles
- 1.3 investigate and compare the use of iron, copper, brass and plastic components
- 1.4 identify the symbols that are used to depict common fixtures and fittings
- 1.5 identify the code requirements for installing a residential plumbing system
- 1.6 identify appropriate methods of cutting iron, copper, steel and plastic pipe

2. create a drawing of a water supply system and a DWV system for a typical plumbing fixture

- 2.1 sketch a typical water supply system and a DWV system for a typical household fixture

3. apply plumbing skills to assist in the installation of a water supply system and a DWV system

- 3.1 describe and demonstrate approved methods of joining pipe using solder, adhesives, mechanical joints and threaded fasteners
- 3.2 determine when to use face-to-face, centre-to-centre and shoulder-to-shoulder measurements
- 3.3 use a plumbing layout drawing to create a detailed materials list and cost estimate
- 3.4 locate and use the appropriate fire extinguisher for a given type of fire
- 3.5 describe the health hazards associated with the use of solder and plastic adhesives
- 3.6 use the appropriate tools, materials and techniques to:
 - 3.6.1 rough in a water supply system and a DWV system
 - 3.6.2 pressure test a supply system
 - 3.6.3 install a fixture and connect supply and drainage lines

4. demonstrate basic competencies

- 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems
- 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely

- 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. identify possible life roles related to the skills and content of this cluster**
 - 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2090: CLIMATE CONTROL SYSTEMS

Level: Intermediate

Prerequisite: CON1010: Construction 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.

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

Supporting Course: CON1070: Building Construction

Outcomes: The student will:

- 1. list and describe the major components of a typical HVAC system**
 - 1.1 research the methods heat is transferred; e.g., convection, radiation, gravity
 - 1.2 identify the parts of a typical HVAC system
 - 1.3 compare hot water with forced air heating
 - 1.4 identify and describe the types of warm/cold air distribution systems; e.g., perimeter loop, radial, trunk, branch
 - 1.5 explain how heating systems are sized, how the number of outlets is calculated and how locations are determined
 - 1.6 examine a typical heating system and determine how room temperatures are regulated
 - 1.7 explain the effects on air quality when there is a lack of ventilation
 - 1.8 describe the cost effectiveness of heating with various fuels
- 2. prepare a preventive maintenance schedule for an HVAC system**
 - 2.1 identify the service routines that should be followed for a heating and cooling system
 - 2.2 prepare a service schedule for the HVAC component
- 3. service or install an HVAC system**
 - 3.1 prepare a layout for a part of an HVAC system
 - 3.2 assist in the installation of an HVAC system
 - 3.3 service a component of an HVAC system
- 4. demonstrate basic competencies**
 - 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems
 - 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely

- 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. identify possible life roles related to the skills and content of this cluster**
 - 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2100: AGRI-STRUCTURES

Level: Intermediate

Prerequisite: CON1010: Construction Tools & Materials

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

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

Supporting Course: CON1070: Building Construction

Outcomes: The student will:

- 1. identify the major issues that must be addressed when designing an agri-structure**
 - 1.1 describe the types of materials and structures used in agriculture businesses
 - 1.2 list the factors that affect the choice of materials and design of agri-structure including:
 - 1.2.1 human and environmental safety standards
 - 1.2.2 animal comfort and safety
 - 1.2.3 crop protection
 - 1.2.4 conditions of use
 - 1.2.5 ease of construction and maintenance
 - 1.2.6 material cost
- 2. read and interpret the appropriate drawings and specifications to create a material and cost estimate**
 - 2.1 produce/select an agri-structure design that:
 - 2.1.1 uses two or more types of structural materials
 - 2.1.2 applies basic construction principles and processes
 - 2.1.3 meets industry standards
 - 2.2 estimate the cost of materials and prepare a work schedule
- 3. construct a structure for use in agriculture**
 - 3.1 use the appropriate tools, materials and processes to construct and finish a structure
- 4. demonstrate basic competencies**
 - 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems
 - 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely
 - 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks

5. identify possible life roles related to the skills and content of this cluster

- 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
- 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2120: MULTIPLE MATERIALS

Level: Intermediate

Prerequisite: CON1120: Product Management

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

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

Outcomes: The student will:

- 1. identify advantages of using different materials in a product**
 - 1.1 describe the properties of common production materials
 - 1.2 research and state the reasons for using combinations of wood, metal, plastic, ceramic and other materials
 - 1.3 identify indicators of a quality product
- 2. apply knowledge of structural materials, planning and construction techniques to produce a product from different materials**
 - 2.1 select, modify or design a product that incorporates two or more materials in its construction
 - 2.2 identify the methods by which different materials are fastened together
 - 2.3 identify health and safety concerns associated with a given material
 - 2.4 prepare a detailed sequence of operations that facilitates the safe and efficient use of materials and tools
 - 2.5 create a cutting list and cost estimate
 - 2.6 use the appropriate tools and supplies to safely:
 - 2.6.1 measure and lay out components
 - 2.6.2 cut and remove waste from materials
 - 2.6.3 form components, where required
 - 2.6.4 fasten or bond components
 - 2.6.5 align and clamp components
 - 2.6.6 prepare for finishing
 - 2.7 identify the types of finishes that are compatible with wood, metal, plastic, ceramic and other surfaces
 - 2.8 select compatible finishes
 - 2.9 finish the product using appropriate finishes
- 3. demonstrate basic competencies**
 - 3.1 demonstrate fundamental skills to:
 - 3.1.1 communicate
 - 3.1.2 manage information
 - 3.1.3 use numbers
 - 3.1.4 think and solve problems

- 3.2 demonstrate personal management skills to:
 - 3.2.1 demonstrate positive attitudes and behaviours
 - 3.2.2 be responsible
 - 3.2.3 be adaptable
 - 3.2.4 learn continuously
 - 3.2.5 work safely
- 3.3 demonstrate teamwork skills to:
 - 3.3.1 work with others
 - 3.3.2 participate in projects and tasks
- 4. identify possible life roles related to the skills and content of this cluster**
 - 4.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 4.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2130: FURNITURE – BOX CONSTRUCTION

Level: Intermediate

Prerequisite: CON1120: Product Management

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

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

Outcomes: The student will:

- 1. identify and describe the design features and processes used to construct a box-type furniture product**
 - 1.1 research typical design and joinery techniques that are commonly used in box construction
 - 1.2 identify construction features including:
 - 1.2.1 door
 - 1.2.2 drawer
 - 1.2.3 plinth
 - 1.3 describe the safe set-up and operation of hand and/or power tools to make a series of joints; e.g., reinforced butt, reinforced mitre, rabbet, dado, finger
 - 1.4 identify and describe the use of common fasteners and clamping procedures used with a specific joint
 - 1.5 identify common fittings and construction techniques used to make the following doors:
 - 1.5.1 flush
 - 1.5.2 sliding
 - 1.5.3 tambour
 - 1.5.4 fall-flap
- 2. apply basic furniture making skills to plan and construct a piece of furniture based on box construction techniques**
 - 2.1 select a box-type product that requires the use of:
 - 2.1.1 solid wood and/or composites
 - 2.1.2 a variety of joints and fasteners
 - 2.1.3 typical lay-up and clamping procedures
 - 2.2 prepare a materials list and cost estimate from a working drawing
 - 2.3 prepare a work schedule
 - 2.4 use the appropriate tools, materials and processes to:
 - 2.4.1 measure and lay out stock
 - 2.4.2 cut stock to size
 - 2.4.3 machine surfaces and joints
 - 2.4.4 lay-up, glue, fasten and clamp
 - 2.4.5 fill or plug exposed fasteners
 - 2.4.6 prepare for finishing

3. demonstrate basic competencies

3.1 demonstrate fundamental skills to:

- 3.1.1 communicate
- 3.1.2 manage information
- 3.1.3 use numbers
- 3.1.4 think and solve problems

3.2 demonstrate personal management skills to:

- 3.2.1 demonstrate positive attitudes and behaviours
- 3.2.2 be responsible
- 3.2.3 be adaptable
- 3.2.4 learn continuously
- 3.2.5 work safely

3.3 demonstrate teamwork skills to:

- 3.3.1 work with others
- 3.3.2 participate in projects and tasks

4. identify possible life roles related to the skills and content of this cluster

- 4.1 recognize and then analyze the opportunities and barriers in the immediate environment
- 4.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2140: FURNITURE – FRAME & PANEL

Level: Intermediate

Prerequisite: CON1120: Product Management

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

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

Outcomes: The student will:

- 1. identify and describe the design features and processes used to construct a frame and panel product**
 - 1.1 identify the construction details of a typical frame and panel component
 - 1.2 identify the typical wood joints that are used in frame and panel construction
 - 1.3 identify and describe the types of fastening systems that are used in flat frame construction; e.g., reinforcing plates, dowelling, biscuits, splines
 - 1.4 describe the safe set-up and operation of hand and/or power tools used to make a series of joints; e.g., mortise and tenon, dowel, biscuit, lap, mitre, loose tenon
- 2. apply basic furniture making skills to plan and construct a component or piece of furniture based on frame and panel construction techniques**
 - 2.1 select a frame and panel product or component that requires:
 - 2.1.1 interpretation and development of simple working drawings
 - 2.1.2 use of solid woods and/or composites
 - 2.1.3 use of a variety of wood joints, fasteners and other hardware components
 - 2.1.4 typical lay-up and clamping procedures
 - 2.2 show a detailed materials list, cost estimate and work schedule
 - 2.3 use the appropriate tools, machines and processes to:
 - 2.3.1 measure and lay out stock
 - 2.3.2 cut stock to size
 - 2.3.3 machine and fit joints
 - 2.3.4 lay-up, glue, fasten and/or clamp
 - 2.3.5 fill or plug exposed fasteners, where applicable
 - 2.3.6 finish the project
- 3. demonstrate basic competencies**
 - 3.1 demonstrate fundamental skills to:
 - 3.1.1 communicate
 - 3.1.2 manage information
 - 3.1.3 use numbers
 - 3.1.4 think and solve problems
 - 3.2 demonstrate personal management skills to:
 - 3.2.1 demonstrate positive attitudes and behaviours
 - 3.2.2 be responsible
 - 3.2.3 be adaptable
 - 3.2.4 learn continuously
 - 3.2.5 work safely

- 3.3 demonstrate teamwork skills to:
 - 3.3.1 work with others
 - 3.3.2 participate in projects and tasks
- 4. identify possible life roles related to the skills and content of this cluster**
 - 4.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 4.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2150: FINISHING & REFINISHING

Level: Intermediate

Prerequisite: CON1010: Construction Tools & Materials

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

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

Outcomes: The student will:

1. identify common finishes and finishing/refinishing techniques

- 1.1 describe techniques that are used to:
 - 1.1.1 identify an existing finish
 - 1.1.2 remove a stain or finish
 - 1.1.3 prepare a surface for refinishing
- 1.2 explain:
 - 1.2.1 bleaching and staining
 - 1.2.2 filling and sealing
 - 1.2.3 creating a distressed finish
- 1.3 identify common finishes and applications
- 1.4 explain the purpose of a filler and sealer
- 1.5 identify the preferred method of applying each of the above finishes; e.g., brush, roller, rag, spray gun
- 1.6 describe what thinners and cleaners are used in conjunction with a given finish

2. identify and describe the health hazards and Workplace Hazardous Materials Information System (WHMIS) regulations associated with the products used in finishing/refinishing

- 2.1 describe the manufacturers' recommendations and WHMIS regulations that apply to the use and storage of a given product
- 2.2 for a refinishing project, identify:
 - 2.2.1 the nature of the existing finish and finish removers
 - 2.2.2 appropriate personal protective equipment
- 2.3 for new and old surfaces, do the following:
 - 2.3.1 select a suitable new or replacement finish
 - 2.3.2 prepare a detailed set of step-by-step finishing procedures
 - 2.3.3 clean the product and the work site

3. demonstrate appropriate finishing/refinishing techniques

- 3.1 use the appropriate tools, materials and techniques to:
 - 3.1.1 remove an existing finish
 - 3.1.2 stain and seal
 - 3.1.3 apply the necessary topcoats
 - 3.1.4 sand, rub and polish, as required
- 3.2 discard all rags and used materials in the appropriate containers
- 3.3 identify ways to improve the quality of a finish

4. demonstrate basic competencies

- 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems
- 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely
- 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks

5. identify possible life roles related to the skills and content of this cluster

- 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
- 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2160: CABINETMAKING – WEB & FACE FRAME

Level: Intermediate

Prerequisite: CON1120: Product Management

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

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

Outcomes: The student will:

1. identify and describe the design features and processes used to construct a web and face frame product

- 1.1 describe the principal methods used to construct a built-in cabinet; e.g., on-site construction, modular system
- 1.2 identify the parts of a web frame cabinet
- 1.3 describe the types of joints used in web and face frame construction
- 1.4 describe safe set-up procedures to make common joints associated with web and face frame construction
- 1.5 identify the appropriate fastening systems used in economy and premium grade construction

2. prepare a detailed materials list and event sequence

- 2.1 select or modify a cabinet drawing that uses web and face frame construction
- 2.2 create a work schedule
- 2.3 prepare a material cutting list

3. build a cabinet, using web and face frame construction techniques

- 3.1 use the appropriate tools, materials and processes to:
 - 3.1.1 measure and lay out materials
 - 3.1.2 rough out materials
 - 3.1.3 machine joints and surfaces
 - 3.1.4 assemble, glue, fasten and clamp
 - 3.1.5 fill, scrape and sand

4. demonstrate basic competencies

- 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems
- 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely
- 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks

- 5. identify possible life roles related to the skills and content of this cluster**
 - 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2170: CABINETMAKING – DOOR & DRAWER

Level: Intermediate

Prerequisite: CON1120: Product Management

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

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

Outcomes: The student will:

- 1. identify and describe common methods of designing and constructing cabinet doors and drawers**
 - 1.1 research methods of producing various door treatments including:
 - 1.1.1 raised panel
 - 1.1.2 flush
 - 1.1.3 glass inset
 - 1.2 research common door and drawer construction techniques and hardware options
 - 1.3 identify the common joints used in door and drawer construction
 - 1.4 identify the equipment and describe safe set-up procedures to make a given drawer and door component
- 2. apply cabinetmaking skills to plan and construct door/drawer components**
 - 2.1 select or modify a cabinet drawing of a drawer and built-up door
 - 2.2 select the appropriate door and dresser material
 - 2.3 identify an appropriate door guiding system
 - 2.4 create a material and procedural list
 - 2.5 use the appropriate tools, materials and processes to:
 - 2.5.1 measure and lay out materials
 - 2.5.2 machine surfaces and joints
 - 2.5.3 assemble, glue, fasten and clamp
 - 2.5.4 prepare for finishing
- 3. demonstrate basic competencies**
 - 3.1 demonstrate fundamental skills to:
 - 3.1.1 communicate
 - 3.1.2 manage information
 - 3.1.3 use numbers
 - 3.1.4 think and solve problems
 - 3.2 demonstrate personal management skills to:
 - 3.2.1 demonstrate positive attitudes and behaviours
 - 3.2.2 be responsible
 - 3.2.3 be adaptable
 - 3.2.4 learn continuously
 - 3.2.5 work safely
 - 3.3 demonstrate teamwork skills to:
 - 3.3.1 work with others
 - 3.3.2 participate in projects and tasks

- 4. identify possible life roles related to the skills and content of this cluster**
 - 4.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 4.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2180: WOOD FORMING

Level: Intermediate

Prerequisite: CON1120: Product Management

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

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

Outcomes: The student will:

1. describe common wood forming techniques

- 1.1 research and describe typical methods of bending solid stock and laminates including:
 - 1.1.1 soaking in water
 - 1.1.2 steaming
 - 1.1.3 chemical conditioning
- 1.2 describe how to determine the correct spacing for cross and parallel kerfing
- 1.3 describe a system to moisten or steam wood (plasticize) prior to bending
- 1.4 identify woods that lend themselves to cold water or steam bending
- 1.5 identify methods of building up—moulding and clamping veneer stock
- 1.6 select the most appropriate adhesive for a given application and process

2. build or obtain the necessary moulds and clamping devices to bend a piece of solid stock or wood laminate

- 2.1 select or design a formed product or component
- 2.2 calculate the spacing of kerfs for a given radius bend
- 2.3 design a mould for bending or contouring solid stock
- 2.4 obtain suitable stock for bending

3. apply wood forming skills and techniques to make a product or component

- 3.1 use the appropriate tools, materials and processes to:
 - 3.1.1 prepare solid and/or veneer stock for bending
 - 3.1.2 condition, glue and secure
 - 3.1.3 release and finish

4. demonstrate basic competencies

- 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems
- 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely

- 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. identify possible life roles related to the skills and content of this cluster**
 - 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2190: MANUFACTURING SYSTEMS

Level: Intermediate

Prerequisite: None

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

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

Supporting Course: CON1010: Construction Tools & Materials

Outcomes: The student will:

1. describe current production systems used to manufacture durable goods

- 1.1 describe the development of modern manufacturing from its early roots in the domestic, cottage and factory systems
- 1.2 explain the advantages and disadvantages of a strong manufacturing base in a community
- 1.3 describe the operations of a typical manufacturing system's input requirements, types of processes and outputs, as well as its feedback mechanisms
- 1.4 research a manufacturing company and describe its:
 - 1.4.1 organizational structure
 - 1.4.2 methods of decision making
 - 1.4.3 methods of financing
 - 1.4.4 training practices
 - 1.4.5 research and development
 - 1.4.6 marketing practices
- 1.5 explain how manufacturing is being altered by the global economy and the use of technology

2. identify the lines of communication and decision making in a typical production system

- 2.1 show how a typical manufacturer is able to:
 - 2.1.1 increase productivity
 - 2.1.2 provide for choice
 - 2.1.3 reduce skill level requirements
 - 2.1.4 reduce costs per unit produced

3. explain how the production of durable goods is being altered by the effects of technology and the global economy

- 3.1 describe how computer-assisted manufacturing, just-in-time and total quality management systems increase:
 - 3.1.1 productivity
 - 3.1.2 quality
 - 3.1.3 profitability
- 3.2 explain why manufacturers are interested in locating near:
 - 3.2.1 skilled population bases
 - 3.2.2 resources
 - 3.2.3 markets
- 3.3 describe the place that organized labour has in manufacturing

4. demonstrate basic competencies

4.1 demonstrate fundamental skills to:

- 4.1.1 communicate
- 4.1.2 manage information
- 4.1.3 use numbers
- 4.1.4 think and solve problems

4.2 demonstrate personal management skills to:

- 4.2.1 demonstrate positive attitudes and behaviours
- 4.2.2 be responsible
- 4.2.3 be adaptable
- 4.2.4 learn continuously
- 4.2.5 work safely

4.3 demonstrate teamwork skills to:

- 4.3.1 work with others
- 4.3.2 participate in projects and tasks

5. identify possible life roles related to the skills and content of this cluster

- 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
- 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2200: PRODUCT DEVELOPMENT

Level: Intermediate

Prerequisite: CON1010: Construction Tools & Materials

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

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

Supporting Course: CON2190: Manufacturing Systems

Outcomes: The student will:

- 1. list and describe the steps involved in developing a product for manufacturing**
 - 1.1 describe the life cycle of a typical product from the time of introduction to its decline
 - 1.2 identify reasons for a product being successful; e.g., physical and emotional need, marketing practice, pricing, reputation
 - 1.3 explain how new product ideas are generated
 - 1.4 outline how ideas are developed into new products
 - 1.5 identify the major steps involved in engineering a new product
- 2. apply designing and planning skills to assist in the development of a prototype**
 - 2.1 select or design a product for manufacturing
 - 2.2 create the necessary detail, assembly and schematic drawings
 - 2.3 identify the appropriate materials
 - 2.4 create a prototype product
 - 2.5 test the product
 - 2.6 analyze the design related to:
 - 2.6.1 function
 - 2.6.2 aesthetic appeal
 - 2.6.3 reliability
 - 2.6.4 manufacturability
 - 2.6.5 profitability
 - 2.7 create a market survey
- 3. describe the marketing and manufacturing potential of a product**
 - 3.1 state the importance of product testing and market surveys
- 4. demonstrate basic competencies**
 - 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems

- 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely
- 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. identify possible life roles related to the skills and content of this cluster**
 - 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2910: CON PROJECT B

Level: Intermediate

Prerequisite: None

Description: Students develop project design and management skills to extend and enhance competencies and skills in other CTS courses through contexts that are personally relevant.

Parameters: Intermediate project courses must connect with a minimum of two CTS courses, one of which must be at the intermediate level and be in the same occupational area as the project course. The other CTS course(s) can be at any level from any occupational area.

Project courses cannot be connected to other project courses or practicum courses.

All projects and/or performances, whether teacher- or student-led, must include a course outline or student proposal.

Outcomes:

The teacher/student will:

- 1. identify the connection between this project course and two or more CTS courses**
 - 1.1 identify the outcome(s) from each identified CTS course that support the project and/or performance deliverables
 - 1.2 explain how these outcomes are being connected to the project and/or performance deliverables
- 2. propose the project and/or performance**
 - 2.1 identify the project and/or performance by:
 - 2.1.1 preparing a plan
 - 2.1.2 clarifying the purposes
 - 2.1.3 defining the deliverables
 - 2.1.4 specifying time lines
 - 2.1.5 explaining terminology, tools and processes
 - 2.1.6 defining resources; e.g., materials, costs, staffing
 - 2.2 identify and comply with all related health and safety standards
 - 2.3 define assessment standards (indicators for success)
 - 2.4 present the proposal and obtain necessary approvals

The student will:

- 3. meet goals as defined within the plan**
 - 3.1 complete the project and/or performance as outlined
 - 3.2 monitor the project and/or performance and make necessary adjustments
 - 3.3 present the project and/or performance, indicating the:
 - 3.3.1 outcomes attained
 - 3.3.2 relationship of outcomes to goals originally set

- 3.4 evaluate the project and/or performance, indicating the:
 - 3.4.1 processes and strategies used
 - 3.4.2 recommendations on how the project and/or performance could have been improved
- 4. demonstrate basic competencies**
 - 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems
 - 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely
 - 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. identify possible life roles related to the skills and content of this cluster**
 - 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2920: CON PROJECT C

Level: Intermediate

Prerequisite: None

Description: Students develop project design and management skills to extend and enhance competencies and skills in other CTS courses through contexts that are personally relevant.

Parameters: Intermediate project courses must connect with a minimum of two CTS courses, one of which must be at the intermediate level and be in the same occupational area as the project course. The other CTS course(s) can be at any level from any occupational area.

Project courses cannot be connected to other project courses or practicum courses.

All projects and/or performances, whether teacher- or student-led, must include a course outline or student proposal.

Outcomes:

The teacher/student will:

- 1. identify the connection between this project course and two or more CTS courses**
 - 1.1 identify the outcome(s) from each identified CTS course that support the project and/or performance deliverables
 - 1.2 explain how these outcomes are being connected to the project and/or performance deliverables
- 2. propose the project and/or performance**
 - 2.1 identify the project and/or performance by:
 - 2.1.1 preparing a plan
 - 2.1.2 clarifying the purposes
 - 2.1.3 defining the deliverables
 - 2.1.4 specifying time lines
 - 2.1.5 explaining terminology, tools and processes
 - 2.1.6 defining resources; e.g., materials, costs, staffing
 - 2.2 identify and comply with all related health and safety standards
 - 2.3 define assessment standards (indicators for success)
 - 2.4 present the proposal and obtain necessary approvals

The student will:

- 3. meet goals as defined within the plan**
 - 3.1 complete the project and/or performance as outlined
 - 3.2 monitor the project and/or performance and make necessary adjustments
 - 3.3 present the project and/or performance, indicating the:
 - 3.3.1 outcomes attained
 - 3.3.2 relationship of outcomes to goals originally set

- 3.4 evaluate the project and/or performance, indicating the:
 - 3.4.1 processes and strategies used
 - 3.4.2 recommendations on how the project and/or performance could have been improved
- 4. demonstrate basic competencies**
 - 4.1 demonstrate fundamental skills to:
 - 4.1.1 communicate
 - 4.1.2 manage information
 - 4.1.3 use numbers
 - 4.1.4 think and solve problems
 - 4.2 demonstrate personal management skills to:
 - 4.2.1 demonstrate positive attitudes and behaviours
 - 4.2.2 be responsible
 - 4.2.3 be adaptable
 - 4.2.4 learn continuously
 - 4.2.5 work safely
 - 4.3 demonstrate teamwork skills to:
 - 4.3.1 work with others
 - 4.3.2 participate in projects and tasks
- 5. identify possible life roles related to the skills and content of this cluster**
 - 5.1 recognize and then analyze the opportunities and barriers in the immediate environment
 - 5.2 identify potential resources to minimize barriers and maximize opportunities

COURSE CON2950: CON INTERMEDIATE PRACTICUM

Level: Intermediate

Prerequisite: None

Description: Students apply prior learning and demonstrate the attitudes, skills and knowledge required by an external organization to achieve a credential/credentials or an articulation.

Parameters: This practicum course, which may be delivered on- or off-campus, should be accessed only by students continuing to work toward attaining a recognized credential/credentials or an articulation offered by an external organization. This course must be connected to at least one CTS course from the same occupational area and cannot be used in conjunction with any advanced (3XXX) level course. A practicum course cannot be delivered as a stand-alone course, cannot be combined with a CTS project course and cannot be used in conjunction with the Registered Apprenticeship Program or the Green Certificate Program.

Outcomes: The student will:

- 1. perform assigned tasks and responsibilities, as required by the organization granting the credential(s) or articulation**
 - 1.1 identify regulations and regulatory bodies related to the credential(s) or articulation
 - 1.2 describe personal roles and responsibilities, including:
 - 1.2.1 key responsibilities
 - 1.2.2 support functions/responsibilities/expectations
 - 1.2.3 code of ethics and/or conduct
 - 1.3 describe personal work responsibilities and categorize them as:
 - 1.3.1 routine tasks; e.g., daily, weekly, monthly, yearly
 - 1.3.2 non-routine tasks; e.g., emergencies
 - 1.3.3 tasks requiring personal judgement
 - 1.3.4 tasks requiring approval of a supervisor
 - 1.4 demonstrate basic employability skills and perform assigned tasks and responsibilities related to the credential(s) or articulation
- 2. analyze personal performance in relation to established standards**
 - 2.1 evaluate application of the attitudes, skills and knowledge developed in related CTS courses
 - 2.2 evaluate standards of performance in terms of:
 - 2.2.1 quality of work
 - 2.2.2 quantity of work
 - 2.3 evaluate adherence to workplace legislation related to health and safety
 - 2.4 evaluate the performance requirements of an individual who is trained, experienced and employed in a related occupation in terms of:
 - 2.4.1 training and certification
 - 2.4.2 interpersonal skills
 - 2.4.3 technical skills
 - 2.4.4 ethics

3. demonstrate basic competencies

- 3.1 demonstrate fundamental skills to:
 - 3.1.1 communicate
 - 3.1.2 manage information
 - 3.1.3 use numbers
 - 3.1.4 think and solve problems
- 3.2 demonstrate personal management skills to:
 - 3.2.1 demonstrate positive attitudes and behaviours
 - 3.2.2 be responsible
 - 3.2.3 be adaptable
 - 3.2.4 learn continuously
 - 3.2.5 work safely
- 3.3 demonstrate teamwork skills to:
 - 3.3.1 work with others
 - 3.3.2 participate in projects and tasks

4. identify possible life roles related to the skills and content of this cluster

- 4.1 recognize and then analyze the opportunities and barriers in the immediate environment
- 4.2 identify potential resources to minimize barriers and maximize opportunities