

COURSE CRA3402: BUILDING MATERIALS

Level: First Period Apprenticeship

Prerequisite: CRA3900: Apprenticeship Safety

Description: Students develop knowledge, skills and attitudes in the areas of handling material and wood products; using fasteners, adhesives and sealants; and understanding concrete and its uses as required in the carpenter trade.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyman certification as a carpenter.

ILM Resources: Solid Wood Products and Wood Joinery 020101f; Manufactured Construction Products 020101g; Fasteners, Adhesives and Sealants 020101h; Introduction to Concrete 020101i

Outcomes: The student will:

1. use solid wood products and joinery

- 1.1 describe types and characteristics of solid wood products, including:
 - 1.1.1 the anatomy of trees and the wood produced from various parts
 - 1.1.2 hardwoods and softwoods
- 1.2 describe how lumber is milled, seasoned, stored and ordered, including:
 - 1.2.1 cutting methods
 - 1.2.2 milling classifications
 - 1.2.3 describing air drying and kiln drying
 - 1.2.4 grading lumber
 - 1.2.5 identifying natural and manufacturing flaws
 - 1.2.6 calculating board feet calculations
- 1.3 describe the application of solid wood mouldings, including:
 - 1.3.1 hiding a joint
 - 1.3.2 accentuating a joint
 - 1.3.3 providing protection
 - 1.3.4 specific function
- 1.4 describe wood joining methods for fabrication and installation

2. use manufactured construction products

- 2.1 describe the application of panel products, including:
 - 2.1.1 plywood
 - 2.1.2 veneers
 - 2.1.3 composite panels
 - 2.1.4 fibreboard
 - 2.1.5 hardboard
- 2.2 describe the application of engineered wood products, including:
 - 2.2.1 glued laminated timber products
 - 2.2.2 parallel strand lumber
 - 2.2.3 laminated veneer lumber
 - 2.2.4 finger-jointed studs

- 2.3 describe the application of synthetic and metal products, including:
 - 2.3.1 plastic laminates
 - 2.3.2 high-pressure laminates
 - 2.3.3 low-pressure laminates
 - 2.3.4 solid plastics; e.g., plastic foam board, polystyrene, polyurethane, polyethylene, siding
 - 2.3.5 metal anchors/fasteners
 - 2.3.6 wire mesh/wire fabric
 - 2.3.7 metal framing
 - 2.3.8 metal lathe
 - 2.3.9 metal roofing, siding and soffit
 - 2.3.10 metal bridging, joist hangers and framing connectors
 - 2.3.11 eavestroughs and downspouts
- 3. apply fasteners, adhesives and sealants**
 - 3.1 identify types and function of fasteners, including:
 - 3.1.1 nails
 - 3.1.2 staples
 - 3.1.3 screws
 - 3.1.4 bolts, nuts and washers
 - 3.1.5 anchors
 - 3.2 identify types and functions of adhesives, including:
 - 3.2.1 natural adhesives
 - 3.2.2 synthetic (non-reactive) glues
 - 3.2.3 synthetic (reactive) glues
 - 3.3 identify types and functions of sealants, including:
 - 3.3.1 moisture barriers
 - 3.3.2 surface coatings
 - 3.3.3 sealers
- 4. describe the ingredients, production, placing and curing of concrete**
 - 4.1 identify the ingredients and production of concrete, including:
 - 4.1.1 Portland cement (types 1 to 5)
 - 4.1.2 fine and coarse aggregates
 - 4.1.3 water
 - 4.2 describe the placement and curing of concrete, including:
 - 4.2.1 placement methods
 - 4.2.2 curing considerations
- 5. demonstrate basic competencies**
 - 5.1 demonstrate fundamental skills to:
 - 5.1.1 communicate
 - 5.1.2 manage information
 - 5.1.3 use numbers
 - 5.1.4 think and solve problems
 - 5.2 demonstrate personal management skills to:
 - 5.2.1 demonstrate positive attitudes and behaviours
 - 5.2.2 be responsible
 - 5.2.3 be adaptable
 - 5.2.4 learn continuously
 - 5.2.5 work safely
 - 5.3 demonstrate teamwork skills to:
 - 5.3.1 work with others
 - 5.3.2 participate in projects and tasks

- 6. create a transitional strategy to accommodate personal changes and build personal values**
 - 6.1 identify short-term and long-term goals
 - 6.2 identify steps to achieve goals

COURSE CRA3407: HAND TOOLS THEORY

Level: First Period Apprenticeship

Prerequisite: CRA3402: Building Materials

Description: Students develop knowledge, skills and attitudes in the area of hand tools, including their uses and safe storage as required in the carpenter trade.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyman certification as a carpenter.

ILM Resources: Hand Tools 020102a

Outcomes: The student will:

1. identify and describe the uses of hand tools

1.1 describe the use of measuring, marking, laying-out, aligning and squaring tools, including:

- 1.1.1 flexible tape rules
- 1.1.2 steel tapes
- 1.1.3 pencils
- 1.1.4 scratch awls
- 1.1.5 centre punches
- 1.1.6 compasses
- 1.1.7 dividers
- 1.1.8 trammel points
- 1.1.9 chalk lines
- 1.1.10 try squares
- 1.1.11 combination squares
- 1.1.12 framing squares
- 1.1.13 rafter angle squares
- 1.1.14 sliding T-levels
- 1.1.15 plumb bobs
- 1.1.16 hand levels
- 1.1.17 torpedo levels
- 1.1.18 fixed-beam laser levels
- 1.1.19 string lines

1.2 describe the use of cutting tools (edge, tooth, scraping and sanding abrasives), boring and drilling tools, including:

- 1.2.1 planes
- 1.2.2 chisels
- 1.2.3 utility knives
- 1.2.4 saws
- 1.2.5 metal snips
- 1.2.6 files and rasps
- 1.2.7 scrapers and putty knives
- 1.2.8 sanding blocks
- 1.2.9 drills and bits

- 1.3 describe the use of assembling, dismantling and clamping tools, including:
 - 1.3.1 hammers
 - 1.3.2 nail sets
 - 1.3.3 staple guns
 - 1.3.4 screwdrivers
 - 1.3.5 pliers
 - 1.3.6 wrenches
 - 1.3.7 wrecking bars
 - 1.3.8 nail pullers
 - 1.3.9 clamps

2. demonstrate basic competencies

- 2.1 demonstrate fundamental skills to:
 - 2.1.1 communicate
 - 2.1.2 manage information
 - 2.1.3 use numbers
 - 2.1.4 think and solve problems
- 2.2 demonstrate personal management skills to:
 - 2.2.1 demonstrate positive attitudes and behaviours
 - 2.2.2 be responsible
 - 2.2.3 be adaptable
 - 2.2.4 learn continuously
 - 2.2.5 work safely
- 2.3 demonstrate teamwork skills to:
 - 2.3.1 work with others
 - 2.3.2 participate in projects and tasks

3. create a transitional strategy to accommodate personal changes and build personal values

- 3.1 identify short-term and long-term goals
- 3.2 identify steps to achieve goals

COURSE CRA3412: HAND TOOLS PRACTICAL

Level:	First Period Apprenticeship
Prerequisite:	CRA3407: Hand Tools Theory
Description:	Students demonstrate the safe use and safe storage of hand tools as required in the carpenter trade.
Parameters:	Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journey person certification as a carpenter.
ILM Resources:	Hand Tools 020102a
Outcomes:	The student will:

1. use hand tools

- 1.1 use measuring, marking, laying-out, aligning and squaring tools, including:
 - 1.1.1 flexible tape rules
 - 1.1.2 steel tapes
 - 1.1.3 pencils
 - 1.1.4 scratch awls
 - 1.1.5 centre punches
 - 1.1.6 compasses
 - 1.1.7 dividers
 - 1.1.8 trammel points
 - 1.1.9 chalk lines
 - 1.1.10 try squares
 - 1.1.11 combination squares
 - 1.1.12 framing squares
 - 1.1.13 rafter angle squares
 - 1.1.14 sliding T-levels
 - 1.1.15 plumb bobs
 - 1.1.16 hand levels
 - 1.1.17 torpedo levels
 - 1.1.18 fixed-beam laser levels
 - 1.1.19 string lines
- 1.2 use cutting tools (edge, tooth, scraping and sanding abrasives), boring and drilling tools, including:
 - 1.2.1 planes
 - 1.2.2 chisels
 - 1.2.3 utility knives
 - 1.2.4 saws
 - 1.2.5 metal snips
 - 1.2.6 files and rasps
 - 1.2.7 scrapers and putty knives
 - 1.2.8 sanding blocks
 - 1.2.9 drills and bits

- 1.3 use assembling, dismantling and clamping tools, including:
 - 1.3.1 hammers
 - 1.3.2 nail sets
 - 1.3.3 staple guns
 - 1.3.4 screwdrivers
 - 1.3.5 pliers
 - 1.3.6 wrenches
 - 1.3.7 wrecking bars
 - 1.3.8 nail pullers
 - 1.3.9 clamps

2. demonstrate basic competencies

- 2.1 demonstrate fundamental skills to:
 - 2.1.1 communicate
 - 2.1.2 manage information
 - 2.1.3 think and solve problems
- 2.2 demonstrate personal management skills to:
 - 2.2.1 demonstrate positive attitudes and behaviours
 - 2.2.2 be responsible
 - 2.2.3 be adaptable
 - 2.2.4 learn continuously
 - 2.2.5 work safely
- 2.3 demonstrate teamwork skills to:
 - 2.3.1 work with others
 - 2.3.2 participate in projects and tasks

3. create a transitional strategy to accommodate personal changes and build personal values

- 3.1 identify short-term and long-term goals
- 3.2 identify steps to achieve goals

COURSE CRA3417: PORTABLE POWER TOOLS

Level:	First Period Apprenticeship
Prerequisite:	CRA3412: Hand Tools Practical
Description:	Students develop knowledge, skills and attitudes in the area of portable power tools, including their uses and safe storage as required in the carpenter trade.
Parameters:	Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyman certification as a carpenter.
ILM Resources:	Portable Power Tools 020102b
Outcomes:	The student will:

1. use portable power tools

- 1.1 describe the operation and maintenance of portable saws, including:
 - 1.1.1 circular saws
 - 1.1.2 mitre saws
 - 1.1.3 sliding compound mitre saws
 - 1.1.4 jigsaws
 - 1.1.5 reciprocating saws
- 1.2 describe the operation and maintenance of portable planing and shaping equipment, including:
 - 1.2.1 routers
 - 1.2.2 router tables
 - 1.2.3 laminate trimmers
 - 1.2.4 rotary cut-out tools
 - 1.2.5 power hand planes
- 1.3 describe the operation and maintenance of portable drilling and fastening equipment, including:
 - 1.3.1 portable drills
 - 1.3.2 hammer drills
 - 1.3.3 screw guns
 - 1.3.4 biscuit joiners
- 1.4 describe the operation and maintenance of portable abrasive tools, including:
 - 1.4.1 belt sanders
 - 1.4.2 finishing sanders
 - 1.4.3 cut-off saws

2. demonstrate basic competencies

- 2.1 demonstrate fundamental skills to:
 - 2.1.1 communicate
 - 2.1.2 manage information
 - 2.1.3 use numbers
 - 2.1.4 think and solve problems
- 2.2 demonstrate personal management skills to:
 - 2.2.1 demonstrate positive attitudes and behaviours
 - 2.2.2 be responsible
 - 2.2.3 be adaptable
 - 2.2.4 learn continuously
 - 2.2.5 work safely

- 2.3 demonstrate teamwork skills to:
 - 2.3.1 work with others
 - 2.3.2 participate in projects and tasks
- 3. create a transitional strategy to accommodate personal changes and build personal values**
 - 3.1 identify short-term and long-term goals
 - 3.2 identify steps to achieve goals

COURSE CRA3422: STATIONARY TOOLS

Level: First Period Apprenticeship

Prerequisite: CRA3417: Portable Power Tools

Description: Students develop knowledge, skills and attitudes in the area of stationary power tools, including their uses and safe storage as required in the carpenter trade.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyman certification as a carpenter.

ILM Resources: Stationary Power Tools 020102c

Outcomes: The student will:

1. use stationary power tools

- 1.1 describe the operation and maintenance of stationary saws, including:
 - 1.1.1 table saws
 - 1.1.2 radial arm saws
 - 1.1.3 band saws
- 1.2 describe the operation and maintenance of stationary planing tools, including:
 - 1.2.1 jointers
 - 1.2.2 thickness planers
- 1.3 describe the operation and maintenance of stationary drilling, grinding and sanding tools, including:
 - 1.3.1 drill presses
 - 1.3.2 stationary sanders
 - 1.3.3 floor and bench grinders

2. demonstrate basic competencies

- 2.1 demonstrate fundamental skills to:
 - 2.1.1 communicate
 - 2.1.2 manage information
 - 2.1.3 use numbers
 - 2.1.4 think and solve problems
- 2.2 demonstrate personal management skills to:
 - 2.2.1 demonstrate positive attitudes and behaviours
 - 2.2.2 be responsible
 - 2.2.3 be adaptable
 - 2.2.4 learn continuously
 - 2.2.5 work safely
- 2.3 demonstrate teamwork skills to:
 - 2.3.1 work with others
 - 2.3.2 participate in projects and tasks

3. create a transitional strategy to accommodate personal changes and build personal values

- 3.1 identify short-term and long-term goals
- 3.2 identify steps to achieve goals

COURSE CRA3427: ACCESSORY TOOLS

Level: First Period Apprenticeship

Prerequisite: CRA3422: Stationary Tools

Description: Students develop knowledge, skills and attitudes in the areas of cutters, bits and abrasives, explosive-actuated tools, and pneumatic and fuel-powered tools, their uses and safe storage as required in the carpenter trade.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyman certification as a carpenter.

ILM Resources: Cutters, Bits and Abrasives 020102d; Explosive Actuated Tools 020102e; Pneumatic and Fuel Powered Tools 020102f

Outcomes: The student will:

1. maintain tools and accessories

1.1 describe the equipment used to maintain chisels, plane irons and scrapers, including:

- 1.1.1 grinders
- 1.1.2 waterstones
- 1.1.3 diamond-impregnated stones
- 1.1.4 natural Arkansas stones

1.2 describe the types and uses of sanding abrasives

1.3 describe the types, uses and maintenance of saw blades, including:

- 1.3.1 crosscut saws
- 1.3.2 circular saws
- 1.3.3 dado sets
- 1.3.4 diamond blades

1.4 describe the types, uses and maintenance of drill bits and router bits, including:

- 1.4.1 twist drill bits
- 1.4.2 brad-point drill bits
- 1.4.3 auger bits
- 1.4.4 ship auger bits
- 1.4.5 spade bits
- 1.4.6 multi-spur bits
- 1.4.7 Forstner bits
- 1.4.8 countersink and counter bore bits
- 1.4.9 hole saws
- 1.4.10 concrete and masonry bits
- 1.4.11 router bits

2. use explosive-actuated tools

2.1 differentiate between high- and low-velocity explosive-actuated tools

2.2 describe explosive-actuated tool power loads (low- and high-velocity), power load strength and safety requirements, including:

- 2.2.1 .22, .25 and .27 calibres
- 2.2.2 crimped and wadded end power loads
- 2.2.3 power load number and colour identification system

- 2.3 describe explosive-actuated tool fasteners, accessories and applications, including:
 - 2.3.1 drive pin types
 - 2.3.2 threaded studs
 - 2.3.3 light-duty and heavy-duty fasteners
 - 2.3.4 tension and shear load requirements
- 2.4 assess base material suitability and related fastening requirements, including:
 - 2.4.1 masonry or concrete material
 - 2.4.2 steel base material
- 2.5 describe explosive-actuated system safety and firing procedure, including:
 - 2.5.1 demonstrating tool safety
 - 2.5.2 following personal safety equipment requirements
 - 2.5.3 selecting the proper fastener
 - 2.5.4 selecting the proper power load
- 2.6 perform tool maintenance and use an explosive-actuated tool safely, including:
 - 2.6.1 disassembling the tool
 - 2.6.2 cleaning the tool
 - 2.6.3 inspecting and replacing parts
 - 2.6.4 assembling and testing the tool
 - 2.6.5 following proper storage practices
 - 2.6.6 demonstrating safe operating practices
- 3. use pneumatic and fuel-powered tools**
 - 3.1 describe the operation and maintenance of pneumatic tools, including:
 - 3.1.1 gas and electric compressors; e.g., stationary or portable
 - 3.1.2 nailers; e.g., framing, finish or brad nailers, roofing or shingle nailers, hardwood flooring nailers
 - 3.1.3 staplers; e.g., wide crown, narrow crown, tackers
 - 3.1.4 drills
 - 3.1.5 sanders
 - 3.1.6 screw guns
 - 3.1.7 hoses and couplers
 - 3.2 describe the operation and maintenance of fuel-powered tools, including:
 - 3.2.1 chainsaws
 - 3.2.2 abrasive saws
- 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. create a transitional strategy to accommodate personal changes and build personal values**
 - 5.1 identify short-term and long-term goals
 - 5.2 identify steps to achieve goals

COURSE CRA3432: BUILDING FOUNDATIONS

Level:	First Period Apprenticeship
Prerequisite:	CRA3427: Accessory Tools
Description:	Students develop knowledge, skills and attitudes in the areas of site and building layout, footing preparation, construction design principles and construction footing as required in the carpenter trade.
Parameters:	Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyman certification as a carpenter.
ILM Resources:	Preliminary Building Procedures 020103a; Building Loads and Forces 020103b; Foundation Supports 020103c
Outcomes:	The student will:

1. follow preliminary site and building layout procedures in preparation for footing placement

- 1.1 describe initial on-site procedures, including:
 - 1.1.1 building permits
 - 1.1.2 grade slips
 - 1.1.3 inspections
 - 1.1.4 occupancy permits
 - 1.1.5 land-use plans
 - 1.1.6 real property reports
 - 1.1.7 plot plan (site plan)
- 1.2 describe building layout procedures, including:
 - 1.2.1 location of structure on plot plan
 - 1.2.2 check for square
 - 1.2.3 flagged nails and stake markers
 - 1.2.4 excavation
 - 1.2.5 transit layout
- 1.3 describe the use of levelling equipment, including:
 - 1.3.1 laser levels
 - 1.3.2 optical levels
 - 1.3.3 grading/graduated rods
 - 1.3.4 hand levels
- 1.4 describe excavation and shoring procedures, including:
 - 1.4.1 locating underground facilities
 - 1.4.2 determining depth of excavation
 - 1.4.3 using shoring

2. use construction design principles to counteract the forces that act upon buildings and structures

- 2.1 describe the loads and forces that act upon a building, including:
 - 2.1.1 static loads
 - 2.1.2 dead loads
 - 2.1.3 live loads
 - 2.1.4 environmental loads
 - 2.1.5 dynamic loads

- 2.2 describe the compressive, tensile and lateral forces that act on a building and how those forces are counteracted, including:
 - 2.2.1 horizontal shear
 - 2.2.2 vertical shear
 - 2.2.3 diagonal shear
- 2.3 describe construction design principles used to counteract loads and forces, including:
 - 2.3.1 concrete reinforcement
 - 2.3.2 joists (solid and prefabricated)
 - 2.3.3 control joints
 - 2.3.4 foundation depth
- 3. construct footings**
 - 3.1 describe types of footings, including:
 - 3.1.1 full basement, including walkouts
 - 3.1.2 crawl space foundation
 - 3.1.3 surface foundation
 - 3.1.4 slab on grade
 - 3.1.5 grade beam foundation
 - 3.2 describe layout and construction of footings, including:
 - 3.2.1 transit usage
 - 3.2.2 batter boards
 - 3.2.3 outside footing forms
 - 3.2.4 inside forms
 - 3.2.5 step footing forms
 - 3.2.6 templates and anchors
 - 3.2.7 foundation walls
 - 3.3 describe types of piles and their construction, including:
 - 3.3.1 piers; e.g., friction piles and bearing piles
 - 3.3.2 grade beam piles
- 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. create a transitional strategy to accommodate personal changes and build personal values**
 - 5.1 identify short-term and long-term goals
 - 5.2 identify steps to achieve goals

COURSE CRA3437: FOUNDATIONS THEORY

Level:	First Period Apprenticeship
Prerequisite:	CRA3432: Building Foundations
Description:	Students develop knowledge, skills and attitudes in the areas of site and building layout, footing preparation, construction design principles and construction systems as required in the carpenter trade.
Parameters:	Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyman certification as a carpenter.
ILM Resources:	Concrete Flatwork 020103d; Foundation Systems – Part A 020103eA; Foundation Systems – Part B 020103eB
Outcomes:	The student will:

1. construct concrete flatwork

- 1.1 describe sub-grade preparation, reinforcement and concrete placing requirements for slabs on grade, including:
 - 1.1.1 compaction methods
 - 1.1.2 vapour barriers
 - 1.1.3 slab thickenings
 - 1.1.4 reinforcement
- 1.2 describe forming methods and concrete placement methods for slabs on grade, including:
 - 1.2.1 locating the slab
 - 1.2.2 layout
 - 1.2.3 forming materials
 - 1.2.4 concrete joints; e.g., isolation, control and construction joints
 - 1.2.5 screeding methods
 - 1.2.6 finishing
 - 1.2.7 curing

2. construct foundation systems

- 2.1 describe the components and erection processes for modular foundation form systems, including:
 - 2.1.1 flat-bar forming system
 - 2.1.2 pre-manufactured or patented form systems
- 2.2 describe steel reinforcement, concrete placement and form removal for concrete foundations, including:
 - 2.2.1 anchor bolts
 - 2.2.2 cast-in-place ladder
 - 2.2.3 vibration
 - 2.2.4 rodding
- 2.3 describe moisture protection and backfill requirements for foundation systems, including:
 - 2.3.1 dampproofing
 - 2.3.2 drainage
 - 2.3.3 backfilling

- 2.4 describe permanent wood foundation systems, including:
 - 2.4.1 site preparation
 - 2.4.2 footings
 - 2.4.3 cutting and treatment
 - 2.4.4 wall construction
 - 2.4.5 floor systems
 - 2.4.6 moisture barriers
 - 2.4.7 backfill requirements
- 2.5 describe insulated concrete systems, including:
 - 2.5.1 site preparation and footings
 - 2.5.2 form assembly
 - 2.5.3 bracing requirements
 - 2.5.4 concrete pouring
 - 2.5.5 below-grade finishing
 - 2.5.6 above-grade finishing
- 2.6 describe alternative foundation system types, including:
 - 2.6.1 concrete block foundations
 - 2.6.2 precast concrete foundation systems
- 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. create a transitional strategy to accommodate personal changes and build personal values**
 - 4.1 identify short-term and long-term goals
 - 4.2 identify steps to achieve goals

COURSE CRA3442: FOUNDATIONS PRACTICAL

Level:	First Period Apprenticeship
Prerequisite:	CRA3437: Foundations Theory
Description:	Students demonstrate knowledge, skills and attitudes in the areas of site and building layout, footing preparation, construction design principles and construction systems as required in the carpenter trade.
Parameters:	Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyman certification as a carpenter.
ILM Resources:	Concrete Flatwork 020103d; Foundation Systems Part A 020103eA; Foundation Systems Part B 020103eB
Outcomes:	The student will:

1. construct concrete flatwork

- 1.1 demonstrate sub-grade preparation, reinforcement and concrete placing requirements for slabs on grade, including:
 - 1.1.1 compaction methods
 - 1.1.2 vapour barriers
 - 1.1.3 slab thickenings
 - 1.1.4 reinforcement
- 1.2 demonstrate forming methods and concrete placement methods for slabs on grade, including:
 - 1.2.1 locating the slab
 - 1.2.2 layout
 - 1.2.3 forming materials
 - 1.2.4 concrete joints; e.g., isolation, control and construction joints
 - 1.2.5 screeding methods
 - 1.2.6 finishing
 - 1.2.7 curing

2. construct foundation systems

- 2.1 demonstrate the erection processes for modular foundation form systems, including:
 - 2.1.1 flat-bar forming system
 - 2.1.2 pre-manufactured or patented form systems
- 2.2 demonstrate steel reinforcement, concrete placement and form removal for concrete foundations, including:
 - 2.2.1 anchor bolts
 - 2.2.2 cast-in-place ladder
 - 2.2.3 vibration
 - 2.2.4 rodding
- 2.3 demonstrate moisture protection and backfill requirements for foundation systems, including:
 - 2.3.1 dampproofing
 - 2.3.2 drainage
 - 2.3.3 backfilling
- 2.4 demonstrate how to build permanent wood foundation systems, including:
 - 2.4.1 site preparation
 - 2.4.2 footings

- 2.4.3 cutting and treatment
- 2.4.4 wall construction
- 2.4.5 floor systems
- 2.4.6 moisture barriers
- 2.4.7 backfill requirements
- 2.5 demonstrate how to build insulated concrete systems, including:
 - 2.5.1 site preparation and footings
 - 2.5.2 form assembly
 - 2.5.3 bracing requirements
 - 2.5.4 concrete pouring
 - 2.5.5 below-grade finishing
 - 2.5.6 above-grade finishing
- 2.6 demonstrate how to build alternative foundation system types, including:
 - 2.6.1 concrete block foundations
 - 2.6.2 precast concrete foundation systems
- 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. create a transitional strategy to accommodate personal changes and build personal values**
 - 4.1 identify short-term and long-term goals
 - 4.2 identify steps to achieve goals

COURSE CRA3447: FLOOR FRAMES

- Level:** First Period Apprenticeship
- Prerequisite:** CRA3442: Foundations Practical
- Description:** Students develop knowledge, skills and attitudes in the areas of installation of floor frame supports and construction of floor frames as required in the carpenter trade.
- Parameters:** Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journey person certification as a carpenter.
- ILM Resources:** Floor Frame Support 020103f; Floor Frames 020103g
- Outcomes:** The student will:

1. install floor frame supports

- 1.1 identify beam support types, including:
 - 1.1.1 steel columns
 - 1.1.2 wood columns
 - 1.1.3 engineered wood products
 - 1.1.4 concrete columns
- 1.2 describe the design and construction of beams, including:
 - 1.2.1 steel
 - 1.2.2 dimensional lumber
 - 1.2.3 engineered wood products
- 1.3 describe methods used to anchor the floor frame to the foundation, including:
 - 1.3.1 ladder systems
 - 1.3.2 sill plate systems
 - 1.3.3 cast-in-place systems

2. construct a floor frame

- 2.1 describe the components of a residential floor frame, including:
 - 2.1.1 balloon framing and post and beam construction
 - 2.1.2 platform framing
- 2.2 describe the layout and installation procedures for floor frame systems, including:
 - 2.2.1 joist spacing
 - 2.2.2 stairwells and other openings
 - 2.2.3 headers
 - 2.2.4 trimmer and tail joists
 - 2.2.5 non-load-bearing partitions
 - 2.2.6 load-bearing walls
 - 2.2.7 mechanical considerations
 - 2.2.8 cantilevered joists
- 2.3 describe joist restraints and subfloor sheathing installation, including:
 - 2.3.1 cross-bridging
 - 2.3.2 fasteners and adhesives
 - 2.3.3 notching and drilling solid wood joists

- 2.4 describe the components and the installation of engineered floor systems, including:
 - 2.4.1 composite lumber
 - 2.4.2 floor trusses
 - 2.4.3 “T” joists
 - 2.4.4 beam and joist hangers
- 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. create a transitional strategy to accommodate personal changes and build personal values**
 - 4.1 identify short-term and long-term goals
 - 4.2 identify steps to achieve goals

COURSE CRA3452: SKETCHING & DRAWING

Level: First Period Apprenticeship

Prerequisite: CRA3447: Floor Frames

Description: Students develop knowledge, skills and attitudes in the areas of basic drawing techniques, orthographic projection and production of isometric drawings as required in the carpenter trade.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyperson certification as a carpenter.

ILM Resources: Drawing Basics 020104a; Orthographic Drawings – Part A 020104bA; Orthographic Drawings – Part B 020104bB; Pictorial Drawings and Sketching 020104c; Drawing Standards 020104d

Outcomes: The student will:

1. use drawing instruments

- 1.1. describe the functions of drawing instruments, including:
 - 1.1.1 pencils
 - 1.1.2 T-squares
 - 1.1.3 set squares
 - 1.1.4 scale rules
 - 1.1.5 protractors
 - 1.1.6 compasses
 - 1.1.7 templates
 - 1.1.8 drafting boards
- 1.2. complete geometric shape exercises using drawing instruments, including:
 - 1.2.1 bisecting lines
 - 1.2.2 bisecting angles
 - 1.2.3 drawing angles
 - 1.2.4 drawing circles
 - 1.2.5 drawing octagons
 - 1.2.6 drawing hexagons
- 1.3. describe the applications of geometry in trade situations
- 1.4. draw objects incorporating shapes and angles

2. draw orthographic projections of objects

- 2.1 describe the concept and principles of orthographic projection
- 2.2 draw orthographic projections of objects, including:
 - 2.2.1 sloped surfaces
 - 2.2.2 circular and curved surfaces
 - 2.2.3 oblique surfaces

3. use sketching and pictorial drawing techniques to produce isometric drawings

- 3.1 describe sketching and pictorial drawing methods
- 3.2 use isometric drawing techniques
- 3.3 produce isometric drawings

4. create orthographic views, section views, detail views and a cutting list for a shop project

4.1 identify drawing conventions for orthographic and section views and details, including:

- 4.1.1 line types
- 4.1.2 dimensions
- 4.1.3 tolerances
- 4.1.4 confined spaces
- 4.1.5 text
- 4.1.6 page layout
- 4.1.7 sections
- 4.1.8 break lines
- 4.1.9 symbols
- 4.1.10 details

4.2 describe the requirements for a cutting list

4.3 produce drawings and a cutting list for a shop project

5. demonstrate basic competencies

5.1 demonstrate fundamental skills to:

- 5.1.1 communicate
- 5.1.2 manage information
- 5.1.3 use numbers
- 5.1.4 think and solve problems

5.2 demonstrate personal management skills to:

- 5.2.1 demonstrate positive attitudes and behaviours
- 5.2.2 be responsible
- 5.2.3 be adaptable
- 5.2.4 learn continuously
- 5.2.5 work safely

5.3 demonstrate teamwork skills to:

- 5.3.1 work with others
- 5.3.2 participate in projects and tasks

6. create a transitional strategy to accommodate personal changes and build personal values

6.1 identify short-term and long-term goals

6.2 identify steps to achieve goals

COURSE CRA3457: DRAWING PRINCIPLES

- Level:** First Period Apprenticeship
- Prerequisite:** CRA3452: Sketching & Drawing
- Description:** Students develop knowledge, skills and attitudes in the interpretation of working drawings and construction documentation as required in the carpenter trade.
- Parameters:** Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyman certification as a carpenter.
- ILM Resources:** Drawing Interpretation Principles – Part A 020104eA; Drawing Interpretation Principles – Part B 020104eB; Drawing Interpretation Principles – Part C 020104eC; Drawing Interpretation Principles – Part D 020104eD; Drawing Interpretation Principles – Part E 020104eE
- Outcomes:** The student will:

1. interpret a set of working drawings and construction documents

- 1.1 identify the paper language conventions used on working drawings
- 1.2 describe architectural drawings
- 1.3 describe structural drawings
- 1.4 describe mechanical drawings
- 1.5 describe electrical drawings
- 1.6 describe shop drawings
- 1.7 identify the different orthographic views found on a set of working drawings, including:
 - 1.7.1 plans
 - 1.7.2 elevations
 - 1.7.3 building cross-sections
 - 1.7.4 sections
 - 1.7.5 details
- 1.8 describe specifications, discrepancies and path in a set of working drawings, including:
 - 1.8.1 location drawings
 - 1.8.2 architectural drawings
 - 1.8.3 structural drawings
 - 1.8.4 mechanical drawings
 - 1.8.5 electrical drawings
 - 1.8.6 shop drawings
- 1.9 interpret working drawings, including:
 - 1.9.1 foundation
 - 1.9.2 basement partitions and stairs
 - 1.9.3 main beams and floor joists
 - 1.9.4 grade beams and piles
 - 1.9.5 mechanical foundation
 - 1.9.6 electrical foundation
 - 1.9.7 floor plans
 - 1.9.8 windows and doors (interior and exterior)
 - 1.9.9 partitions
 - 1.9.10 cabinets, millwork and hardware

- 1.9.11 stairs
- 1.9.12 roof beams
- 1.9.13 transverse and longitudinal build sections

2. demonstrate basic competencies

- 2.1 demonstrate fundamental skills to:
 - 2.1.1 communicate
 - 2.1.2 manage information
 - 2.1.3 use numbers
 - 2.1.4 think and solve problems
- 2.2 demonstrate personal management skills to:
 - 2.2.1 demonstrate positive attitudes and behaviours
 - 2.2.2 be responsible
 - 2.2.3 be adaptable
 - 2.2.4 learn continuously
 - 2.2.5 work safely
- 2.3 demonstrate teamwork skills to:
 - 2.3.1 work with others
 - 2.3.2 participate in projects and tasks

3. create a transitional strategy to accommodate personal changes and build personal values

- 3.1 identify short-term and long-term goals
- 3.2 identify steps to achieve goals

COURSE CRA3462: MATH CONCEPTS

Level: First Period Apprenticeship

Prerequisite: None

Description: Students develop knowledge, skills and attitudes in the application of mathematical concepts to solve problems in both metric and imperial measurements as required in the carpenter trade.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journey person certification as a carpenter.

ILM Resources: Math Concepts – Part A 020104fA; Math Concepts – Part B 020104fB; Math Concepts – Part C 020104fC; Math Concepts – Part D 020104fD; Math Concepts – Part E 020104fE

Outcomes: The student will:

1. apply math concepts to solve problems using both the metric and imperial systems of measurement

- 1.1 describe math equations and order of operations
- 1.2 describe calculator functions and operations
- 1.3 describe the metric and imperial measurement systems
- 1.4 perform calculations involving fractions
- 1.5 convert measurements between metric and imperial systems
- 1.6 perform calculations using the Pythagorean theorem
- 1.7 determine the perimeter and centreline perimeter for various shapes and buildings
- 1.8 determine the area and volume for various shapes and objects
- 1.9 perform ratio and proportion calculations
- 1.10 perform percentage calculations

2. demonstrate basic competencies

- 2.1 demonstrate fundamental skills to:
 - 2.1.1 communicate
 - 2.1.2 manage information
 - 2.1.3 use numbers
 - 2.1.4 think and solve problems
- 2.2 demonstrate personal management skills to:
 - 2.2.1 demonstrate positive attitudes and behaviours
 - 2.2.2 be responsible
 - 2.2.3 be adaptable
 - 2.2.4 learn continuously
 - 2.2.5 work safely
- 2.3 demonstrate teamwork skills to:
 - 2.3.1 work with others
 - 2.3.2 participate in projects and tasks

3. create a transitional strategy to accommodate personal changes and build personal values

- 3.1 identify short-term and long-term goals
- 3.2 identify steps to achieve goals

COURSE CRA3467: ESTIMATING

Level: First Period Apprenticeship

Prerequisite: CRA3462: Math Concepts

Description: Students develop knowledge, skills and attitudes in estimating forming materials, concrete materials and floor systems materials as required in the carpenter trade.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyman certification as a carpenter.

ILM Resources: Estimate Foundation Forms and Concrete Material Requirements 020104g;
Estimate Floor Systems Material Requirements 020104h

Outcomes: The student will:

- 1. calculate the quantity of forming material and concrete required for concrete foundations**
 - 1.1 describe the difference between a material takeoff and an estimate
 - 1.2 estimate material requirements for forming strip footings, pad footings and foundation walls
 - 1.3 estimate concrete volume requirements for footings, pilings and foundation walls
 - 1.4 estimate concrete volume requirements for floor areas
- 2. calculate the quantity of framing materials required for conventionally framed floor and floor support systems**
 - 2.1 calculate material takeoffs for floor support systems
 - 2.2 calculate material takeoffs for floor frames
 - 2.3 calculate material takeoffs for sub-floor coverings
- 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. create a transitional strategy to accommodate personal changes and build personal values**
 - 4.1 identify short-term and long-term goals
 - 4.2 identify steps to achieve goals

COURSE CRA3470: CRA PRACTICUM A

Level: First Period Apprenticeship

Prerequisite: None

Description: Students, on the work site, continue to develop and refine those competencies developed in related Career and Technology Studies (CTS) occupational areas, previous practicums and other experiences.

Parameters: This course should be accessed only by students continuing to work toward attaining a recognized credential offered by an agency external to the school. Practicum courses extend the competencies developed in related CTS occupational areas. The practicum courses may not be delivered as stand-alone courses and may not be combined with core courses. This course may not be used in conjunction with Registered Apprenticeship Program courses. This practicum course may be delivered on- or off-campus. Instruction must be delivered by a qualified teacher with journeyman certification or an experienced professional with journeyman certification, who is under the supervision of the qualified teacher; both must be authorized to supervise trainees for the external credential.

Outcomes: The student will:

- 1. perform assigned tasks and responsibilities efficiently and effectively, as required by the agency granting credentials**
 - 1.1 identify regulations and regulatory bodies related to the credential
 - 1.2 describe personal roles and responsibilities, including:
 - 1.2.1 key responsibilities
 - 1.2.2 support functions/responsibilities
 - 1.2.3 code of ethics
 - 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
- 2. analyze personal performance in relation to established standards**
 - 2.1 evaluate application of competencies 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 policies and procedures related to health and safety
 - 2.4 evaluate the work environment in terms of:
 - 2.4.1 location
 - 2.4.2 floor plan of work area
 - 2.4.3 analysis of workflow patterns

- 2.5 evaluate a professional in a related occupation in terms of:
 - 2.5.1 training and certification
 - 2.5.2 interpersonal skills
 - 2.5.3 technical skills
 - 2.5.4 professional 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

COURSE CRA3475: CRA PRACTICUM B

Level: First Period Apprenticeship

Prerequisite: None

Description: Students, on the work site, continue to develop and refine those competencies developed in related Career and Technology Studies (CTS) occupational areas, previous practicums and other experiences.

Parameters: This course should be accessed only by students continuing to work toward attaining a recognized credential offered by an agency external to the school. Practicum courses extend the competencies developed in related CTS occupational areas. The practicum courses may not be delivered as stand-alone courses and may not be combined with core courses. This course may not be used in conjunction with Registered Apprenticeship Program courses. This practicum course may be delivered on- or off-campus. Instruction must be delivered by a qualified teacher with journeyman certification or an experienced professional with journeyman certification, who is under the supervision of the qualified teacher; both must be authorized to supervise trainees for the external credential.

Outcomes: The student will:

- 1. perform assigned tasks and responsibilities efficiently and effectively, as required by the agency granting credentials**
 - 1.1 identify regulations and regulatory bodies related to the credential
 - 1.2 describe personal roles and responsibilities, including:
 - 1.2.1 key responsibilities
 - 1.2.2 support functions/responsibilities
 - 1.2.3 code of ethics
 - 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
- 2. analyze personal performance in relation to established standards**
 - 2.1 evaluate application of competencies 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 policies and procedures related to health and safety
 - 2.4 evaluate the work environment in terms of:
 - 2.4.1 location
 - 2.4.2 floor plan of work area
 - 2.4.3 analysis of workflow patterns

- 2.5 evaluate a professional in a related occupation in terms of:
 - 2.5.1 training and certification
 - 2.5.2 interpersonal skills
 - 2.5.3 technical skills
 - 2.5.4 professional 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

COURSE CRA3480: CRA PRACTICUM C

Level: First Period Apprenticeship

Prerequisite: None

Description: Students, on the work site, continue to develop and refine those competencies developed in related Career and Technology Studies (CTS) occupational areas, previous practicums and other experiences.

Parameters: This course should be accessed only by students continuing to work toward attaining a recognized credential offered by an agency external to the school. Practicum courses extend the competencies developed in related CTS occupational areas. The practicum courses may not be delivered as stand-alone courses and may not be combined with core courses. This course may not be used in conjunction with Registered Apprenticeship Program courses. This practicum course may be delivered on- or off-campus. Instruction must be delivered by a qualified teacher with journeyman certification or an experienced professional with journeyman certification, who is under the supervision of the qualified teacher; both must be authorized to supervise trainees for the external credential.

Outcomes: The student will:

- 1. perform assigned tasks and responsibilities efficiently and effectively, as required by the agency granting credentials**
 - 1.1 identify regulations and regulatory bodies related to the credential
 - 1.2 describe personal roles and responsibilities, including:
 - 1.2.1 key responsibilities
 - 1.2.2 support functions/responsibilities
 - 1.2.3 code of ethics
 - 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
- 2. analyze personal performance in relation to established standards**
 - 2.1 evaluate application of competencies 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 policies and procedures related to health and safety
 - 2.4 evaluate the work environment in terms of:
 - 2.4.1 location
 - 2.4.2 floor plan of work area
 - 2.4.3 analysis of workflow patterns

- 2.5 evaluate a professional in a related occupation in terms of:
 - 2.5.1 training and certification
 - 2.5.2 interpersonal skills
 - 2.5.3 technical skills
 - 2.5.4 professional 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

COURSE CRA3485: CRA PRACTICUM D

Level: First Period Apprenticeship

Prerequisite: None

Description: Students, on the work site, continue to develop and refine those competencies developed in related Career and Technology Studies (CTS) occupational areas, previous practicums and other experiences.

Parameters: This course should be accessed only by students continuing to work toward attaining a recognized credential offered by an agency external to the school. Practicum courses extend the competencies developed in related CTS occupational areas. The practicum courses may not be delivered as stand-alone courses and may not be combined with core courses. This course may not be used in conjunction with Registered Apprenticeship Program courses. This practicum course may be delivered on- or off-campus. Instruction must be delivered by a qualified teacher with journeyperson certification or an experienced professional with journeyperson certification, who is under the supervision of the qualified teacher; both must be authorized to supervise trainees for the external credential.

Outcomes: The student will:

- 1. perform assigned tasks and responsibilities efficiently and effectively, as required by the agency granting credentials**
 - 1.1 identify regulations and regulatory bodies related to the credential
 - 1.2 describe personal roles and responsibilities, including:
 - 1.2.1 key responsibilities
 - 1.2.2 support functions/responsibilities
 - 1.2.3 code of ethics
 - 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
- 2. analyze personal performance in relation to established standards**
 - 2.1 evaluate application of competencies 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 policies and procedures related to health and safety
 - 2.4 evaluate the work environment in terms of:
 - 2.4.1 location
 - 2.4.2 floor plan of work area
 - 2.4.3 analysis of workflow patterns

- 2.5 evaluate a professional in a related occupation in terms of:
 - 2.5.1 training and certification
 - 2.5.2 interpersonal skills
 - 2.5.3 technical skills
 - 2.5.4 professional 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

COURSE CRA3900: APPRENTICESHIP SAFETY

Level:	First Period Apprenticeship
Prerequisite:	None
Description:	Students develop knowledge, skills and attitudes in the practice of workshop health and safety, communication and career planning.
Parameters:	Access to a materials work centre and to instruction from an individual with specialized training in occupational health and safety (and understanding of the carpentry industry) and/or an individual with journeyman certification as a carpenter.
ILM Resources:	Safety Legislation, Regulations and Industry Policy in the Trades 020101a; Climbing, Lifting, Rigging and Hoisting 020101b; Hazardous Materials and Fire Protection 020101c; Construction Equipment Safety 020101d; Apprenticeship Training Program Orientation 020101e
Note:	This course may promote discussions around sensitive topics (e.g., injury and death) in the context of student safety with respect to workplace hazards.
Outcomes:	The student will:

1. describe legislation, regulations and practices intended to ensure a safe workplace in the carpenter apprenticeship trade

- 1.1 demonstrate the ability to apply the *Occupational Health and Safety Act (OHS), Regulation and Code*
- 1.2 explain the core requirements applicable to all industries, including:
 - 1.2.1 engineering controls
 - 1.2.2 administrative controls
 - 1.2.3 personal protective equipment (PPE)
- 1.3 explain the role of the employer and employee in regard to occupational health and safety legislation, considering:
 - 1.3.1 employer responsibilities (OHS Regulation)
 - 1.3.2 employee responsibilities (OHS Regulation)
 - 1.3.3 Workplace Hazardous Materials Information System (WHMIS)
 - 1.3.4 fire regulations
 - 1.3.5 Workers' Compensation Board (WCB)
 - 1.3.6 related advisory bodies and agencies; e.g., Alberta Construction Safety Association (ACSA), Construction Owners Association of Alberta (COAA), Occupational Health and Safety Council (OHSC), Work Safe Alberta, Safety Codes Council
- 1.4 explain industry practices for hazard assessment and control procedures in four main hazard categories, including:
 - 1.4.1 biological
 - 1.4.2 chemical
 - 1.4.3 ergonomic
 - 1.4.4 physical hazards

- 1.5 identify and describe hazard assessment tools that both employees and employers must use in assessing and controlling work-site hazards, including:
 - 1.5.1 work-site hazard identification and assessment
 - 1.5.2 health and safety plan
 - 1.5.3 joint work-site health and safety committee
 - 1.5.4 emergency response plans
 - 1.5.5 first-aid and incident reports
- 1.6 identify and describe engineering controls that provide the highest level of worker protection, including:
 - 1.6.1 elimination
 - 1.6.2 substitution
 - 1.6.3 redesign
 - 1.6.4 isolation
 - 1.6.5 automation
- 1.7 identify and describe employer administrative controls that limit hazards to the lowest level possible, including:
 - 1.7.1 safe work practices
 - 1.7.2 job procedures, policies and rules
 - 1.7.3 work/rest schedules to reduce exposure
 - 1.7.4 limiting hours of work
 - 1.7.5 scheduling hazardous work during non-peak times
 - 1.7.6 using optional methods
- 1.8 describe the responsibilities of employees and employers to apply emergency procedures, including:
 - 1.8.1 emergency response plans
 - 1.8.2 first aid
- 1.9 describe positive tradesperson attitudes with respect to legal responsibilities for all workers, including:
 - 1.9.1 housekeeping
 - 1.9.2 lighting
 - 1.9.3 personal protective equipment (PPE)
 - 1.9.4 emergency procedures
- 1.10 describe the roles and responsibilities of employers and employees with respect to the selection and use of personal protective equipment (PPE), including:
 - 1.10.1 eye protection; e.g., class 1 (spectacles), class 2 (goggles), class 3 (welding helmets), class 4 (welding hand shields), class 5 (hoods), class 6 (face shields), class 7 (respirator face pieces)
 - 1.10.2 flame resistant clothing
 - 1.10.3 foot protection; e.g., category 1, 2 or 3 footwear requirements
 - 1.10.4 head protection; e.g., class G (general), class E (electrical), class C (conducting)
 - 1.10.5 hearing protection; e.g., earplugs or earmuffs
 - 1.10.6 life jackets and personal flotation devices (PFDs)
 - 1.10.7 limb and body protection
 - 1.10.8 respiratory protective equipment; e.g., particulate filters; chemical cartridges or canisters; airline respirators, hoods, helmets and suits; self-contained breathing apparatus (SCBA)
 - 1.10.9 a combination of any of the above

- 2. describe the use of PPE and safe practices for climbing, lifting, rigging and hoisting in the carpenter apprenticeship trade**
 - 2.1 select, use and maintain specialized PPE and materials for climbing, lifting and loading, including:
 - 2.1.1 full body harness
 - 2.1.2 body belt
 - 2.1.3 ladders
 - 2.1.4 scaffold systems
 - 2.1.5 lifting and moving equipment
 - 2.1.6 PPE for lifting
 - 2.1.7 materials handling equipment; e.g., forklift, four-wheel dolly, chain hoist, overhead crane
 - 2.2 describe manual lifting procedures, including correct body mechanics, considering:
 - 2.2.1 back safety
 - 2.2.2 general procedure for lifting
 - 2.2.3 employer and employee preventive actions to avoid back injuries
 - 2.3 describe rigging hardware and the safe work load associated with:
 - 2.3.1 wire rope slings
 - 2.3.2 synthetic fibre web slings
 - 2.3.3 chain slings
 - 2.3.4 rigging hardware inspection
 - 2.4 select the correct equipment for rigging typical loads, including:
 - 2.4.1 eye bolts
 - 2.4.2 shackles
 - 2.4.3 rings and links
 - 2.4.4 hooks
 - 2.4.5 swivels
 - 2.4.6 spreader bars and equalization beams
 - 2.4.7 blocks
 - 2.4.8 sheaves
 - 2.4.9 turnbuckles
 - 2.5 describe hoisting and load-moving procedures
- 3. describe the safety practices for hazardous materials and fire protection in the carpenter apprenticeship trade**
 - 3.1 describe the roles, responsibilities, features and practices related to the WHMIS program, including:
 - 3.1.1 suppliers', employers' and employees' responsibilities
 - 3.1.2 WHMIS classifications
 - 3.1.3 health effects from exposure to chemicals
 - 3.2 describe the three key elements of WHMIS, including:
 - 3.2.1 worker education
 - 3.2.2 supplier and workplace product labelling
 - 3.2.3 material safety data sheets
 - 3.3 describe handling, storage and transportation procedures when dealing with hazardous material, including:
 - 3.3.1 handling, storing and transporting flammable liquids
 - 3.3.2 handling, storing and transporting compressed gas
 - 3.3.3 storing incompatible materials

- 3.4 describe safe venting procedures when working with hazardous materials, including:
 - 3.4.1 mechanical general ventilation
 - 3.4.2 local ventilation
 - 3.4.3 portable smoke extractor
 - 3.4.4 working in a confined space
- 3.5 describe fire hazards, classes, procedures and equipment related to fire protection, including:
 - 3.5.1 elements of a fire
 - 3.5.2 classes of fires
 - 3.5.3 fire extinguisher labels
 - 3.5.4 extinguishing small fires
 - 3.5.5 the PASS method
- 4. apply safe work practices with construction equipment**
 - 4.1 identify construction equipment
 - 4.2 use safe work practices when working with construction equipment
- 5. describe the process for managing an apprenticeship to journeyman certification**
 - 5.1 describe the contractual responsibilities of the apprentice, employer and Alberta Apprenticeship and Industry Training
 - 5.2 describe the purpose of the record book
 - 5.3 describe the procedure for changing employers during apprenticeship
 - 5.4 describe the purpose of the course outline
 - 5.5 describe the procedure for advancing through apprenticeship
 - 5.6 describe employment opportunities in this trade
- 6. demonstrate communication skills and workshop safety as they pertain to occupational health and safety standards**
 - 6.1 use various types of communication to provide trade-related information, employing standard terms for components and operations, including:
 - 6.1.1 personal appearance
 - 6.1.2 business appearance
 - 6.1.3 suppliers and sales representatives
 - 6.1.4 customers
 - 6.1.5 tradespeople
 - 6.2 identify key areas of responsibility that an employee has in regards to shop and trade safety, including:
 - 6.2.1 housekeeping
 - 6.2.2 waste containers
 - 6.2.3 power tools and rotating machinery
 - 6.2.4 compressed air
 - 6.2.5 exhaust gases
 - 6.2.6 control of carbon monoxide (CO)
 - 6.2.7 hazardous materials, dangerous goods and controlled products
 - 6.3 explain the correct use of fire extinguishers, and explain fire prevention techniques
- 7. demonstrate an understanding of the carpenter apprenticeship trade and of apprenticeship opportunities that exist by creating a personal career portfolio**
 - 7.1 refine and present a personal career portfolio, showing evidence of strengths and competencies, including:
 - 7.1.1 application completion
 - 7.1.2 cover letter
 - 7.1.3 résumé with references
 - 7.2 demonstrate knowledge of workplace requirements, rights and responsibilities and relate this knowledge to personal career/employment expectations

- 7.3 outline the educational requirements to move into the carpenter apprenticeship trade and:
 - 7.3.1 conduct successful employment searches
 - 7.3.2 communicate in the language in which business is conducted
 - 7.3.3 prepare a personal employment search portfolio
- 7.4 use technologies, tools and information systems appropriately for job preparation
- 8. demonstrate basic competencies**
 - 8.1 demonstrate fundamental skills to:
 - 8.1.1 communicate
 - 8.1.2 manage information
 - 8.1.3 use numbers
 - 8.1.4 think and solve problems
 - 8.2 demonstrate personal management skills to:
 - 8.2.1 demonstrate positive attitudes and behaviours
 - 8.2.2 be responsible
 - 8.2.3 be adaptable
 - 8.2.4 learn continuously
 - 8.2.5 work safely
 - 8.3 demonstrate teamwork skills to:
 - 8.3.1 work with others
 - 8.3.2 participate in projects and tasks
- 9. create a transitional strategy to accommodate personal changes and build personal values**
 - 9.1 identify short-term and long-term goals
 - 9.2 identify steps to achieve goals