

**COURSE CRA3400: INTRODUCTION TO WORK SITE SAFETY**

**Level:** First Period Apprenticeship

**Prerequisite:** None

**Description:** Students develop an understanding of basic work site safety practices.

**Parameters:** Access to a materials work centre and to instruction from an individual with specialized training in work site safety.

**ILM Resources:** Work Site Safety 020101a, Fire Prevention and Control 020101b, Ladders and Scaffolds 020101c, Workplace Hazardous Materials Information System (WHMIS) 020101d

**Supporting Resources:** Basic Math Concepts 020108a, Calculate Perimeter and Centreline Perimeter 020108b, Calculate Areas and Volumes 020108c, Calculating Ratio and Proportion, Mechanical Advantage and Percentage 020108d, Estimate Foundation Forms and Concrete 020108e, Estimate Residential Floor Systems 020108f

**Outcomes:** The student will:

**1. apply *Occupational Health and Safety Regulation* and safe work practices in the workplace**

- 1.1 interpret *Occupational Health and Safety Regulation* related to:
  - 1.1.1 employer responsibilities
  - 1.1.2 employee responsibilities
  - 1.1.3 general safety precautions
  - 1.1.4 accidents
- 1.2 describe the following requirements for personal protective equipment and safety measures:
  - 1.2.1 personal protective equipment
  - 1.2.2 working alone
  - 1.2.3 compressed air
  - 1.2.4 equipment guards
  - 1.2.5 trenches
  - 1.2.6 excavations
  - 1.2.7 floor openings
  - 1.2.8 fall arrest systems
  - 1.2.9 asbestos abatement
- 1.3 describe emergency procedures for dealing with injured workers; e.g., first aid
- 1.4 describe the following potential health hazards:
  - 1.4.1 loading scaffolding materials
  - 1.4.2 working in the heat
  - 1.4.3 working in the cold
  - 1.4.4 fatigue
  - 1.4.5 exposure to natural wood dust
  - 1.4.6 exposure to lead-based paint
  - 1.4.7 exposure to carbon monoxide
  - 1.4.8 flammable liquids and gases
  - 1.4.9 back safety

## **2. identify and describe fire classes, extinguishers, prevention and detection**

- 2.1 describe the following about fires and the appropriate fire extinguishers suitable to fight fires:
  - 2.1.1 physics of fire
  - 2.1.2 elements of fire
  - 2.1.3 ignition
  - 2.1.4 classification of fires
  - 2.1.5 portable fire extinguishers
  - 2.1.6 identification of fire extinguishers
  - 2.1.7 extinguisher maintenance
  - 2.1.8 proper use of portable fire extinguishers
- 2.2 describe procedures and equipment related to fire prevention, detection and warning including:
  - 2.2.1 fire safety considerations
  - 2.2.2 storage of rags
  - 2.2.3 fire watch
  - 2.2.4 emergency action plan
  - 2.2.5 fire safety checklist
  - 2.2.6 welding and cutting

## **3. identify and describe types and safe applications of ladders and scaffolding**

- 3.1 describe the following:
  - 3.1.1 ladder selection
  - 3.1.2 construction ladders
  - 3.1.3 design of construction ladders
  - 3.1.4 occupational health and safety
  - 3.1.5 ladder size selection
  - 3.1.6 ladder positioning
  - 3.1.7 stepladder selection
  - 3.1.8 ladder duty ratings and materials
  - 3.1.9 ladder accessories
  - 3.1.10 proper use of ladders
  - 3.1.11 precautions
- 3.2 describe the following:
  - 3.2.1 general description of scaffolds
  - 3.2.2 scaffold selection
  - 3.2.3 scaffold systems
  - 3.2.4 frame scaffold
  - 3.2.5 elevating platforms and aerial devices
  - 3.2.6 occupational health and safety
  - 3.2.7 scaffolds
  - 3.2.8 free-standing and rolling scaffolds
  - 3.2.9 guardrail systems
  - 3.2.10 scaffold planks and platforms

## **4. describe WHMIS requirements and labelling used by the construction industry**

- 4.1 describe the three key elements of WHMIS:
  - 4.1.1 education and training
  - 4.1.2 product labelling
  - 4.1.3 material safety data sheets
- 4.2 identify WHMIS labels and describe the hazards associated with controlled products; e.g., health effects from exposure to chemicals

**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 CRA3405: BASIC HAND, POWER TOOLS & SAFETY**

**Level:** First Period Apprenticeship

**Prerequisite:** None

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

**Parameters:** Access to a materials work centre, complete with basic construction tools, and to instruction from an individual with journey person certification in the carpentry trade.

**ILM Resources:** Hand Tools 020103a, Portable Power Tools 020103b, Stationary Power Tools 020103c, Cutters, Bits and Abrasives 020103d

**Supporting Resources:** Basic Math Concepts 020108a, Calculate Perimeter and Centreline Perimeter 020108b, Calculate Areas and Volumes 020108c, Calculating Ratio and Proportion, Mechanical Advantage and Percentage 020108d, Estimate Foundation Forms and Concrete 020108e, Estimate Residential Floor Systems 020108f

**Outcomes:** The student will:

**1. identify common hand tools and describe their proper uses**

1.1 identify and describe the use of measuring, marking, laying out, aligning and squaring tools

1.2 identify and describe the use of:

- 1.2.1 edge cutting tools
- 1.2.2 planes
- 1.2.3 chisels
- 1.2.4 utility knives
- 1.2.5 tooth-cutting tools
- 1.2.6 saws
- 1.2.7 files and rasps
- 1.2.8 scraping tools
- 1.2.9 sanding abrasives
- 1.2.10 boring and drilling tools
- 1.2.11 drills
- 1.2.12 drill bits

1.3 identify and describe the use of:

- 1.3.1 assembling tools
- 1.3.2 hammers
- 1.3.3 screwdrivers
- 1.3.4 pliers and wrenches
- 1.3.5 dismantling tools
- 1.3.6 clamping tools
- 1.3.7 curved claw hammers

## **2. identify and describe the safe operation and maintenance of portable power tools**

- 2.1 identify and describe the safe operation of portable saws including:
  - 2.1.1 portable power tool safety
  - 2.1.2 extension cords
  - 2.1.3 circular saws
  - 2.1.4 power mitre saws
  - 2.1.5 sliding compound mitre saws
  - 2.1.6 jigsaws
  - 2.1.7 reciprocating saws
- 2.2 identify and describe the safe operation of the following portable planing and shaping equipment:
  - 2.2.1 routers and laminate trimmers
  - 2.2.2 router tables
  - 2.2.3 rotary cut-out tool (spiral saw)
  - 2.2.4 power hand planes
- 2.3 identify and describe the safe operation of the following portable drilling and fastening equipment:
  - 2.3.1 portable drills
  - 2.3.2 hammer drills
  - 2.3.3 screw guns
  - 2.3.4 biscuit joiners
  - 2.3.5 electric power nailers
- 2.4 identify and describe the safe operation of the following portable abrasive tools:
  - 2.4.1 sanders
  - 2.4.2 disc sanders and grinders
  - 2.4.3 portable cut-off saws
  - 2.4.4 cordless portable power tools

## **3. identify and describe the safe operation and maintenance of stationary power tools**

- 3.1 identify and describe the safe operation and regular maintenance, including basic maintenance checks, of the following stationary saws:
  - 3.1.1 table saws
  - 3.1.2 radial arm saws
  - 3.1.3 radial arm saw styles
  - 3.1.4 radial arm saw operations
  - 3.1.5 band saws
  - 3.1.6 bevel cuts
- 3.2 identify and describe the safe operation and regular maintenance, including basic maintenance checks, of the following stationary planing tools:
  - 3.2.1 jointers
  - 3.2.2 jointer operations
  - 3.2.3 thickness planers
  - 3.2.4 thickness planer parts
- 3.3 identify and describe the safe operation and regular maintenance, including basic maintenance checks, of the following stationary drilling, grinding and sanding tools:
  - 3.3.1 drill press operations
  - 3.3.2 stationary sanders
  - 3.3.3 grinders

- 4. describe the use and maintenance of cutting tools and abrasives**
  - 4.1 describe the action of a cutting edge on a work piece; e.g., cutting directions
  - 4.2 identify and describe the abrasive materials, machines, processes and tools used to maintain chisels, plane irons and scrapers including:
    - 4.2.1 sharpening chisels and plane irons
    - 4.2.2 grinding wheels
    - 4.2.3 whetting or honing
    - 4.2.4 scrapers
  - 4.3 describe the types and uses of sanding abrasives
  - 4.4 identify and describe the types, uses and maintenance of saw blades including:
    - 4.4.1 saw blade classification
    - 4.4.2 circular saws
    - 4.4.3 dado sets
    - 4.4.4 abrasive and diamond blades
  - 4.5 identify and describe the types, uses and maintenance of drill bits and router bits including:
    - 4.5.1 twist drill bits
    - 4.5.2 drill sharpening procedure
    - 4.5.3 drill bits
    - 4.5.4 concrete and masonry drill bits
    - 4.5.5 router bits
- 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 CRA3410: CONSTRUCTION MATERIALS & PROCESSES**

**Level:** First Period Apprenticeship

**Prerequisite:** None

**Description:** Students examine common building materials, processes and how they relate to common building systems in the construction trade.

**Parameters:** Access to a materials work centre, complete with basic construction tools, and to instruction from an individual with journey person certification in the carpentry trade.

**ILM Resources:** Solid Wood Products and Wood Joinery 020102a, Manufactured Construction Products 020102b, Fasteners, Adhesives and Sealants 020102c, Introduction to Concrete 020102d

**Supporting Resources:** Basic Math Concepts 020108a, Calculate Perimeter and Centreline Perimeter 020108b, Calculate Areas and Volumes 020108c, Calculating Ratio and Proportion, Mechanical Advantage and Percentage 020108d, Estimate Foundation Forms and Concrete 020108e, Estimate Residential Floor Systems 020108f

**Outcomes:** The student will:

**1. identify and describe solid wood products and joinery**

1.1 describe common types and characteristics of solid wood products including:

- 1.1.1 how a tree grows
- 1.1.2 anatomy of trees
- 1.1.3 cell structure and growth
- 1.1.4 classification of woods
- 1.1.5 hardwoods
- 1.1.6 softwoods

1.2 describe how wood is milled, seasoned, stored and ordered including:

- 1.2.1 milling lumber
- 1.2.2 cutting methods
- 1.2.3 milling classifications
- 1.2.4 seasoning or drying lumber
- 1.2.5 testing for moisture content
- 1.2.6 characteristics of shrinkage
- 1.2.7 lumber grading
- 1.2.8 grade stamps
- 1.2.9 defects that affect grading
- 1.2.10 natural flaws
- 1.2.11 knot shapes
- 1.2.12 knot types
- 1.2.13 manufacturing flaws
- 1.2.14 seasoning defects
- 1.2.15 grading by classification

- 1.2.16 grades of lumber for general construction and light framing
- 1.2.17 lumber size terminology
- 1.2.18 ordering, storing and handling wood products
- 1.2.19 board feet
- 1.3 identify and describe the application of commonly used mouldings
- 1.4 identify and describe the application of wood joints for fabrication and installation
- 2. identify and describe manufactured building products used in the construction industry**
  - 2.1 identify and describe the application of panel products including:
    - 2.1.1 plywood
    - 2.1.2 veneer
    - 2.1.3 other products and applications
    - 2.1.4 marking (grading)
    - 2.1.5 working with plywood
    - 2.1.6 composite panels
  - 2.2 identify and describe the application of the following engineered wood products:
    - 2.2.1 glued laminated timber products
    - 2.2.2 parallel strand lumber
    - 2.2.3 finger-jointed studs
  - 2.3 identify and describe the application of the following synthetic and metal products:
    - 2.3.1 plastic laminates
    - 2.3.2 solid plastics
    - 2.3.3 polyethylene (plastic film membranes)
    - 2.3.4 siding
    - 2.3.5 other metal products and hardware
- 3. identify different types, functions and applications of some of the more common fasteners, adhesives and sealants**
  - 3.1 identify the types and functions of fasteners commonly used in construction including:
    - 3.1.1 fasteners
    - 3.1.2 nails
    - 3.1.3 staples
    - 3.1.4 screws
    - 3.1.5 specialty screws
    - 3.1.6 bolts and nuts
    - 3.1.7 anchors
  - 3.2 identify the types and functions of adhesives commonly used in construction including:
    - 3.2.1 adhesives (glues)
    - 3.2.2 natural adhesives
    - 3.2.3 synthetic (nonreactive) glues
    - 3.2.4 synthetic (reactive) glues
  - 3.3 identify the types and functions of sealants commonly used in construction including:
    - 3.3.1 mastics
    - 3.3.2 sealants
    - 3.3.3 caulking
    - 3.3.4 caulking tools and techniques
    - 3.3.5 caulking guns

- 4. describe the ingredients, production, placing and curing of concrete**
  - 4.1 identify the ingredients and production of concrete including:
    - 4.1.1 concrete components
    - 4.1.2 Portland cement
    - 4.1.3 aggregates
    - 4.1.4 water
    - 4.1.5 water/cement ratio
    - 4.1.6 production of concrete
    - 4.1.7 ordering concrete from a ready mix plant
    - 4.1.8 concrete delivery
  - 4.2 describe the placement and curing of concrete including:
    - 4.2.1 maximum allowable placing time
    - 4.2.2 placing concrete method
    - 4.2.3 curing
- 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 CRA3415: SITE PREPARATION & FLOOR SYSTEMS**

**Level:** First Period Apprenticeship

**Prerequisite:** None

**Description:** Students examine common site preparations and floor frame systems.

**Parameters:** Access to a building site and/or construction facility and to instruction from an individual with journeyman certification in the carpentry trade.

**ILM Resources:** Preliminary Building Operations 020104a, Building Loads and Forces 020106a, Floor Frame Support Systems 020106b, Residential Floor Frames 020106c

**Supporting Resources:** Basic Math Concepts 020108a, Calculate Perimeter and Centreline Perimeter 020108b, Calculate Areas and Volumes 020108c, Calculating Ratio and Proportion, Mechanical Advantage and Percentage 020108d, Estimate Foundation Forms and Concrete 020108e, Estimate Residential Floor Systems 020108f

**Outcomes:** The student will:

**1. identify preliminary building operations required prior to excavation and the footings being placed**

- 1.1 describe the following initial site procedures and requirements:
  - 1.1.1 permission from local authorities
  - 1.1.2 compliance with by-laws
  - 1.1.3 permits
  - 1.1.4 grade slips
  - 1.1.5 inspections
  - 1.1.6 occupancy permits
  - 1.1.7 property boundaries
  - 1.1.8 plot plan (site plan)
  - 1.1.9 soil and the foundation
- 1.2 describe building layout procedures
- 1.3 describe the application of levelling equipment including:
  - 1.3.1 optical levels
  - 1.3.2 styles of optical levels
  - 1.3.3 laser levels
  - 1.3.4 line levels
  - 1.3.5 hand levels
  - 1.3.6 water levels
- 1.4 describe excavation and shoring considerations including the:
  - 1.4.1 location of underground facilities
  - 1.4.2 depth of excavation
  - 1.4.3 excavation safety considerations
  - 1.4.4 disposal of the soil from the excavation

- 2. identify and describe the forces that act upon buildings and the design principles used to counteract these forces**
  - 2.1 describe the forces, live loads and dead loads that act on a building including:
    - 2.1.1 structural loads
    - 2.1.2 static loads
    - 2.1.3 dynamic loads
    - 2.1.4 loads acting on structures
  - 2.2 describe the following compressive, tensile and lateral forces that act on a building and how these forces are counteracted:
    - 2.2.1 loads and stresses
    - 2.2.2 tension
    - 2.2.3 compression
    - 2.2.4 shear
    - 2.2.5 horizontal shear
    - 2.2.6 vertical shear
    - 2.2.7 diagonal shear (tension)
  - 2.3 describe the following construction design principles used to counteract loads and forces:
    - 2.3.1 materials
    - 2.3.2 concrete reinforcement
    - 2.3.3 joists
    - 2.3.4 control joints
    - 2.3.5 water
    - 2.3.6 frost action in soils
    - 2.3.7 foundation depth
    - 2.3.8 foundation walls
- 3. describe floor frame support systems**
  - 3.1 describe the design and construction of beam supports including:
    - 3.1.1 columns
    - 3.1.2 steel columns
    - 3.1.3 wood columns
    - 3.1.4 solid wood columns
    - 3.1.5 built-up columns
    - 3.1.6 engineered wood products
    - 3.1.7 glued-laminated columns
    - 3.1.8 concrete columns
    - 3.1.9 interior load-bearing walls
    - 3.1.10 pony walls
    - 3.1.11 beam pockets
  - 3.2 describe the design and construction of commonly used beams including:
    - 3.2.1 introduction to beams
    - 3.2.2 steel beams
    - 3.2.3 beam identification
    - 3.2.4 supported joist length
    - 3.2.5 wood beams
  - 3.3 describe the methods used to anchor the floor frame to the foundation including:
    - 3.3.1 ladder systems
    - 3.3.2 sill plate systems
    - 3.3.3 cast-in-place systems

**4. identify and describe the components and installation of a residential floor frame and describe floor frame support systems**

- 4.1 identify and describe the following components of a residential floor frame:
  - 4.1.1 framing styles
  - 4.1.2 platform framing
  - 4.1.3 floor system components
  - 4.1.4 bridging
  - 4.1.5 joist support
  - 4.1.6 minimum floor joist dimensions
- 4.2 describe the layout and installation procedures for floor frame systems including:
  - 4.2.1 layout
  - 4.2.2 joist spacing
  - 4.2.3 layout methods
  - 4.2.4 marking additional joists
  - 4.2.5 openings larger than code regulations
  - 4.2.6 interior walls
  - 4.2.7 mechanical
  - 4.2.8 cantilevered joists
  - 4.2.9 installation procedures
- 4.3 describe joist restraints and subfloor sheathing installation including:
  - 4.3.1 joist restraint
  - 4.3.2 layout of cross-bridging
  - 4.3.3 floor sheathing
  - 4.3.4 notching and drilling solid wood joists
- 4.4 describe the components and the installation of engineered floor systems including:
  - 4.4.1 description of engineered floor systems
  - 4.4.2 terminology for I-beams and open web trusses
  - 4.4.3 beam and joist hangers
  - 4.4.4 notching and drilling engineered joists
  - 4.4.5 trusses
  - 4.4.6 handling and storage of engineered floor components

**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 CRA3420: FOUNDATIONS & CONCRETE STRUCTURES**

**Level:** First Period Apprenticeship

**Prerequisite:** None

**Description:** Students develop knowledge and skills related to the preparation and construction of a concrete foundation and/or alternative foundations.

**Parameters:** Access to a building site and/or construction facility and to instruction from an individual with journey person certification in the carpentry trade.

**ILM Resources:** Foundation Supports 020105a, Concrete Flatwork 020105b, Conventional Concrete Foundations 020105c, Alternate Foundation Systems 020105d

**Supporting Resources:** Basic Math Concepts 020108a, Calculate Perimeter and Centreline Perimeter 020108b, Calculate Areas and Volumes 020108c, Calculating Ratio and Proportion, Mechanical Advantage and Percentage 020108d, Estimate Foundation Forms and Concrete 020108e, Estimate Residential Floor Systems 020108f

**Outcomes:** The student will:

**1. describe continuous and independent footings for light construction**

1.1 describe the following design considerations for concrete footings:

- 1.1.1 foundation types
- 1.1.2 grade beam foundations
- 1.1.3 foundation excavations
- 1.1.4 soil and the foundation
- 1.1.5 footing design and codes
- 1.1.6 footings
- 1.1.7 step or stepped footings

1.2 describe the layout and construction of concrete footings, considering:

- 1.2.1 location of the footing
- 1.2.2 top of footing elevation
- 1.2.3 templates and anchors
- 1.2.4 reinforcement
- 1.2.5 preparation for foundation walls
- 1.2.6 placement of concrete

1.3 describe the various types of piles and their construction

**2. construct slabs that will meet the service requirements with low construction costs and minimal future maintenance**

2.1 describe the sub-grade preparation, reinforcement and concrete placing requirements for slabs on grade including:

- 2.1.1 sub-grade preparation
- 2.1.2 the sub-base
- 2.1.3 vapour barriers
- 2.1.4 slab thickenings

- 2.2 describe the following forming methods and concrete placement methods for slabs on grade:
  - 2.2.1 locating the slab
  - 2.2.2 forming materials
  - 2.2.3 concrete joints
  - 2.2.4 placement and screeding
  - 2.2.5 screeding methods
  - 2.2.6 finishing
  - 2.2.7 curing
- 3. describe construction methods for conventional concrete foundations**
  - 3.1 describe the components and erection processes for Strip-Ease and other modular foundation form systems including:
    - 3.1.1 modular forming systems
    - 3.1.2 flat-bar forming systems
    - 3.1.3 tie spacings
    - 3.1.4 preplanning
    - 3.1.5 beam pockets
    - 3.1.6 window bucks
    - 3.1.7 erecting the flat-bar form system
    - 3.1.8 premanufactured or patented form systems
    - 3.1.9 erecting premanufactured forms
  - 3.2 describe steel reinforcement, concrete placement and form removal for concrete foundations including:
    - 3.2.1 steel reinforcement
    - 3.2.2 floor frame attachment
    - 3.2.3 concrete placement
    - 3.2.4 placing concrete in the forms
    - 3.2.5 vibrating
    - 3.2.6 removing forms
  - 3.3 describe the damp proofing, drainage and backfill requirements for concrete foundations
- 4. describe alternate foundation systems**
  - 4.1 identify and describe the following components of a permanent wood foundation (PWF) system and the required construction procedures:
    - 4.1.1 site preparation
    - 4.1.2 footings for PWF
    - 4.1.3 PWF framing
    - 4.1.4 framed openings
    - 4.1.5 PWF plywood
    - 4.1.6 attachment to footings
    - 4.1.7 basement floor systems
    - 4.1.8 main floor systems
  - 4.2 identify and describe the following components of insulated concrete form (ICF) systems and basic construction procedures:
    - 4.2.1 ICF systems
    - 4.2.2 ICF site preparation
    - 4.2.3 ICF assembly
    - 4.2.4 reinforcing for ICF
    - 4.2.5 bracing requirements for ICF
    - 4.2.6 concrete for ICF
    - 4.2.7 inspection and repair of ICF
    - 4.2.8 exterior finishing

- 4.3 identify and describe other foundation systems including:
  - 4.3.1 concrete block foundations
  - 4.3.2 window and door bucks
  - 4.3.3 block wall components
  - 4.3.4 backfilling
  - 4.3.5 pre-cast concrete foundation systems
  - 4.3.6 assembly of pre-cast foundations
- 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 CRA3425: BLUEPRINT DRAWINGS & SKETCHING**

**Level:** First Period Apprenticeship

**Prerequisite:** None

**Description:** Students develop the knowledge and skills to use instruments to produce and interpret meaningful drawings.

**Parameters:** Access to drawing tools, drawing tables, equipment and materials and/or a computer with a software package and a printer or plotter. Access to instruction from an individual with specialized training in drafting and/or computer design.

**ILM Resources:** Drafting Basics – Part A 020107aA, Drafting Basics – Part B 020107aB, Orthographic Drawings – Part A 020107bA, Orthographic Drawings – Part B 020107bB

**Supporting Resources:** DES1050 CAD1, Basic Math Concepts 020108a, Calculate Perimeter and Centreline Perimeter 020108b, Calculate Areas and Volumes 020108c, Calculating Ratio and Proportion, Mechanical Advantage and Percentage 020108d, Estimate Foundation Forms and Concrete 020108e, Estimate Residential Floor Systems 020108f

**Outcomes:** The student will:

**1. identify and demonstrate the use of basic drawing instruments**

- 1.1 describe the functions of basic drawing instruments including:
  - 1.1.1 paper sizes
  - 1.1.2 set-up and basic use of the equipment
  - 1.1.3 metric scale rule
  - 1.1.4 imperial scale rule
- 1.2 use drafting equipment to complete the following geometric exercises:
  - 1.2.1 using the set square
  - 1.2.2 basic geometry exercises
  - 1.2.3 bisect a line at 90°
  - 1.2.4 draw a line at 90° (perpendicular) to a point on a baseline
  - 1.2.5 bisect an angle
  - 1.2.6 draw a 60° and a 30° angle
  - 1.2.7 draw a 45° and a 22.5° angle
  - 1.2.8 find the centre of a circle or an arc
  - 1.2.9 draw a hexagon within a circle
  - 1.2.10 draw an octagon within a square
  - 1.2.11 draw parallel lines
  - 1.2.12 divide lengths into equal spaces
  - 1.2.13 round the intersection of two lines
  - 1.2.14 divide a line into equal spaces
  - 1.2.15 draw parallel lines
  - 1.2.16 find the centre of a line or space

- 1.3 describe the applications of geometry in trade situations; e.g., checking tools for accuracy
- 1.4 practise producing shapes, angles and drawings to scale by using basic drafting instruments to:
  - 1.4.1 draw lines of scale
  - 1.4.2 draw an octagon centred on a page
  - 1.4.3 draw a solid wood framed door
- 2. describe the concepts and principles of orthographic projection**
  - 2.1 identify the concepts of orthographic presentation including:
    - 2.1.1 developing and positioning of views
    - 2.1.2 viewing of surfaces
- 3. sketch orthographic projections of objects that have:**
  - **surfaces parallel to the viewing plane**
  - **hidden edges or surfaces**
  - **sloped surfaces**
  - **oblique surfaces**
  - **curved surfaces or holes**
  - 3.1 develop the concepts of orthographic projections for:
    - 3.1.1 creating an orthographic drawing
    - 3.1.2 layout of orthographic views
    - 3.1.3 vertical and horizontal surfaces
    - 3.1.4 exercises:
      - 3.1.4.1 hidden surfaces
      - 3.1.4.2 sloped surfaces
      - 3.1.4.3 circular and curved surfaces
      - 3.1.4.4 oblique surfaces
- 4. identify and practise the drawing techniques and principles used to produce isometric drawings**
  - 4.1 describe pictorial drawing methods including:
    - 4.1.1 perspective drawings
    - 4.1.2 three-point perspective drawings
    - 4.1.3 two-point perspective drawings
    - 4.1.4 one-point perspective drawings
    - 4.1.5 oblique drawings
  - 4.2 describe the isometric principles for:
    - 4.2.1 isometric drawings
    - 4.2.2 isometric axis
    - 4.2.3 developing an isometric drawing
  - 4.3 sketch an isometric projection
  - 4.4 describe how isometric angles are shown and drawn
  - 4.5 sketch an isometric projection
  - 4.6 describe how to develop/draw isometric circles and arcs
  - 4.7 sketch an isometric projection
- 5. use basic drawing guidelines and interpretation skills to create the orthographic views, sectional views, details and cutting list required for a shop project**
  - 5.1 describe line types used in orthographic drawings
  - 5.2 demonstrate correct dimensioning methods and techniques including:
    - 5.2.1 dimensioning styles
    - 5.2.2 dimensions
    - 5.2.3 lines
    - 5.2.4 dimension text

- 5.2.5 other dimensioning considerations
- 5.2.6 rules for dimensioning
- 5.3 describe page layout and centring techniques; e.g., centring a drawing on a page
- 5.4 describe section and details and the use of material symbols including:
  - 5.4.1 sections
  - 5.4.2 cutting plane lines
  - 5.4.3 types of sections
  - 5.4.4 breaklines
  - 5.4.5 symbols
  - 5.4.6 details

**6. demonstrate basic competencies**

- 6.1 demonstrate fundamental skills to:
  - 6.1.1 communicate
  - 6.1.2 manage information
  - 6.1.3 use numbers
  - 6.1.4 think and solve problems
- 6.2 demonstrate personal management skills to:
  - 6.2.1 demonstrate positive attitudes and behaviours
  - 6.2.2 be responsible
  - 6.2.3 be adaptable
  - 6.2.4 learn continuously
  - 6.2.5 work safely
- 6.3 demonstrate teamwork skills to:
  - 6.3.1 work with others
  - 6.3.2 participate in projects and tasks

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

- 7.1 identify short-term and long-term goals
- 7.2 identify steps to achieve goals



**COURSE CRA3430: CONSTRUCTION MACHINES, TOOLS & EQUIPMENT**

**Level:** First Period Apprenticeship

**Prerequisite:** None

**Description:** Students examine and develop basic knowledge and skills related to construction machines, tools and equipment.

**Parameters:** Access to a materials work centre, complete with basic construction tools, pneumatic and explosive tools, and to instruction from an individual with specialized training.

**ILM Resources:** Construction Equipment 020104b, Explosive Actuated Tools 020103e, Pneumatic and Fuel-Powered Tools 020103f

**Supporting Resources:** Basic Math Concepts 020108a, Calculate Perimeter and Centreline Perimeter 020108b, Calculate Areas and Volumes 020108c, Calculating Ratio and Proportion, Mechanical Advantage and Percentage 020108d, Estimate Foundation Forms and Concrete 020108e, Estimate Residential Floor Systems 020108f

**Outcomes:** The student will:

**1. identify light and heavy equipment used in construction and employ safe procedures when working with cranes and hoisting equipment**

1.1 identify and describe typical construction equipment including:

- 1.1.1 earthmoving equipment
- 1.1.2 material-handling equipment
- 1.1.3 concrete equipment
- 1.1.4 other equipment

1.2 identify and describe the following hoisting and rigging equipment, methods and procedures:

- 1.2.1 cranes
- 1.2.2 other hoisting equipment
- 1.2.3 safety and on-site considerations
- 1.2.4 crane and hoisting signals
- 1.2.5 hoisting equipment and hardware (rigging)
- 1.2.6 fibre rope
- 1.2.7 rope knots, hitches and bends

**2. describe the safe operation of explosive actuated tools**

2.1 differentiate between high and low velocity explosive actuated tools; e.g., typical applications

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

- 2.2.1 types of power loads
- 2.2.2 power load strength identification
- 2.2.3 safety

2.3 describe explosive actuated tool fasteners, accessories and applications including:

- 2.3.1 fastener types
- 2.3.2 applied loads

- 2.4 assess base material suitability and related fastening requirements including:
  - 2.4.1 centre punch test procedures
  - 2.4.2 unsuitable base materials
  - 2.4.3 masonry or concrete base materials
  - 2.4.4 holding power (fastener load strength) masonry or concrete bore material
  - 2.4.5 steel base material
  - 2.4.6 holding power (fastener load strength) steel base material
- 2.5 describe explosive actuated system safety and firing procedures related to:
  - 2.5.1 general safety
  - 2.5.2 tool safety
  - 2.5.3 personal safety equipment
  - 2.5.4 selecting the proper fastener
  - 2.5.5 loading procedure
  - 2.5.6 firing the tool
  - 2.5.7 conversion kits
  - 2.5.8 tool accessories
- 2.6 perform tool maintenance and use an explosive actuated tool safely including:
  - 2.6.1 use of explosive actuated tools
  - 2.6.2 maintenance and storage
  - 2.6.3 safe operating practices
- 3. identify and describe the safe operation of pneumatic and fuel-powered tools**
  - 3.1 identify and describe the safe operation and maintenance of pneumatic tools including:
    - 3.1.1 pneumatic (air) tools
    - 3.1.2 compressors
    - 3.1.3 extreme weather operations
    - 3.1.4 general safety and usage
    - 3.1.5 nailers
    - 3.1.6 staplers
    - 3.1.7 combustion and electric (cordless) nailers and staplers
    - 3.1.8 fasteners
    - 3.1.9 other air tools
  - 3.2 identify and describe the safe operation and maintenance of fuel-powered tools including:
    - 3.2.1 gas-powered tools
    - 3.2.2 chainsaws
    - 3.2.3 chainsaw parts
    - 3.2.4 chainsaw safety equipment
    - 3.2.5 personal protective equipment
    - 3.2.6 general chainsaw safety
    - 3.2.7 correct chain tension
    - 3.2.8 proper lubrication
    - 3.2.9 saw chains
    - 3.2.10 sharpening saws
    - 3.2.11 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 CRA3435: BLUEPRINT INTERPRETATION**

**Level:** First Period Apprenticeship

**Prerequisite:** CRA3425: Blueprint Drawings & Sketching

**Description:** Students learn to read blueprints and gain the necessary skills required to interpret a set of working drawings.

**Parameters:** Access to drawing tools, drawing tables, equipment and materials and/or a computer with a computer-assisted drafting (CAD) software package and a printer or plotter. Access to instruction from an individual with specialized training in drafting and/or computer design.

**ILM Resources:** Pictorial Drawing and Sketching 020107c, Drawing Standards 020107d, Blueprint Reading Principles 1 – Paper Language 020107e, Blueprint Reading Principles 2 – Views and Groups of Drawings – Part A 020107fA, Blueprint Reading Principles 2 – Views and Groups of Drawings – Part B 020107fB, Blueprint Reading principles 3 – Specifications, Discrepancies and Path 020107g, Basic Blueprint Reading 020107h

**Supporting Resources:** Basic Math Concepts 020108a, Calculate Perimeter and Centreline Perimeter 020108b, Calculate Areas and Volumes 020108c, Calculating Ratio and Proportion, Mechanical Advantage and Percentage 020108d, Estimate Foundation Forms and Concrete 020108e, Estimate Residential Floor Systems 020108f

**Outcomes:** The student will:

- 1. describe and interpret the paper language used in producing a set of working drawings (blueprint)**
  - 1.1 identify and describe the different line styles used in a set of working drawings
  - 1.2 identify the common symbols used in a set of working drawings
  - 1.3 identify abbreviations commonly used on blueprints
  - 1.4 describe the page layout for drawings including:
    - 1.4.1 borders
    - 1.4.2 orientation to compass points
    - 1.4.3 title boxes
  - 1.5 identify and describe different dimensioning techniques including:
    - 1.5.1 plan dimensioning
    - 1.5.2 wood frame structure dimensioning
- 2. identify and interpret the information contained in the different views presented in a set of working drawings (blueprint)**
  - 2.1 identify the different views (drawings) and how they are viewed, and describe the paths between views including:
    - 2.1.1 the development and presentation of different views
    - 2.1.2 plans
    - 2.1.3 elevations
    - 2.1.4 building cross-sections
    - 2.1.5 sections

- 2.1.6 details
- 2.1.7 schedules
- 2.2 identify the following different groups of drawings:
  - 2.2.1 architectural drawings
  - 2.2.2 structural drawings
  - 2.2.3 mechanical drawings
  - 2.2.4 electrical drawings
  - 2.2.5 shop drawings
- 2.3 describe the following different views found in a set of plans:
  - 2.3.1 site plan and location drawings
  - 2.3.2 foundation drawings
  - 2.3.3 floor plans
  - 2.3.4 building cross-sections
  - 2.3.5 sections
  - 2.3.6 shop drawings
- 3. describe and interpret the information contained in a set of blueprints**
  - 3.1 describe specifications
  - 3.2 describe the standards for resolving discrepancies between drawings and specifications; e.g., drawing group precedence
  - 3.3 describe the steps used to navigate through a set of working drawings including:
    - 3.3.1 orientation to the drawing
    - 3.3.2 locating information
    - 3.3.3 the path — navigating through a set of drawings
    - 3.3.4 examples of navigating a set of drawings
- 4. find the required information on a set of blueprints, using systematic steps and guidelines for blueprint reading**
  - 4.1 find information and navigate between the different views in a set of blueprints including:
    - 4.1.1 developing the path to information
    - 4.1.2 working with shop drawings
    - 4.1.3 identifying discrepancies
- 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 CRA3440: CRA PRACTICUM COURSE A**

**Level:** Advanced

**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 or an experienced professional, 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 his or her 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 his or her 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 work flow 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 CRA3445: CRA PRACTICUM COURSE B**

**Level:** Advanced

**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 or an experienced professional, 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 his or her 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 his or her 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 work flow 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 CRA3450: CRA PRACTICUM COURSE C**

**Level:** Advanced

**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 or an experienced professional, 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 his or her 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 his or her 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 work flow 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 CRA3455: CRA PRACTICUM COURSE D**

**Level:** Advanced

**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 or an experienced professional, 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 his or her 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 his or her 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 work flow 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