COURSE PLA3406: HAND AND POWER TOOLS

Level: First Period Apprenticeship

Prerequisite: PLA3900: Apprenticeship Safety

Description: Students demonstrate maintenance and use of hand tools and power tools used in the pipe trades to safely complete various jobs.

Parameters: Access to a materials work centre, complete with basic tools and materials used in the pipe trades, and to instruction from an individual with journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter).

Outcomes: The student will:

1. **use hand tools common to the pipe trades**
   - 1.1 identify hand tools used in the pipe trades
   - 1.2 describe the use of hand tools
   - 1.3 describe the maintenance of hand tools
2. **use power tools common to the pipe trades**
   - 2.1 identify power tools used in the pipe trades
   - 2.2 describe the use of power tools
   - 2.3 describe the maintenance of power tools
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 PLA3411: WELDED PIPE AND FITTINGS

Level: First Period Apprenticeship

Prerequisite: PLA3900: Apprenticeship Safety

Description: Students identify and describe welded pipe and fittings.

Parameters: Access to a materials work centre, complete with basic tools and materials used in the pipe trades, and to instruction from an individual with journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter).

Outcomes: The student will:

1. construct welded and flanged piping system components
- 1.1 identify types, markings, designations, and pressure ratings for welded pipe and fittings
- 1.2 identify stud tensioning systems
- 1.3 state factors, methods, and torque measurements for bolt ups
- 1.4 identify types, markings, designations, temperature, and pressure ratings of flanged fittings and gaskets
- 1.5 describe the fabrication process for welded pipe and fittings to the tack-up stage
- 1.6 describe flange preparation and joining techniques for flanged joints

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 PLA3416: PLASTIC PIPE AND TUBES

Level: First Period Apprenticeship

Prerequisite: PLA3900: Apprenticeship Safety

Description: Students identify, describe, and demonstrate the construction of plastic pipe and tubes.

Parameters: Access to a materials work centre, complete with basic tools and materials used in the pipe trades, and to instruction from an individual with journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter).

Outcomes: The student will:

1. construct plastic piping and tubing systems
- 1.1 identify types, applications, and designations of plastic pipe, tubing, and fittings
- 1.2 describe fabrication processes for solvent welding plastic pipe
- 1.3 describe fabrication processes for plastic pipe and tubing using alternative joining methods
- 1.4 describe fabrication processes for bell-end joints
- 1.5 describe fabrication processes for plastic pipe using thermal fusion and electric resistance welding
- 1.6 fabricate and test a solvent weld spool to the manufacturer's specifications
- 1.7 fabricate and test a fusion weld spool to the manufacturer's specifications

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 PLA3421: THREADED AND GROOVED PIPE

Level: First Period Apprenticeship

Prerequisite: PLA3900: Apprenticeship Safety

Description: Students develop an understanding of threaded and grooved pipe.

Parameters: Access to a materials work centre, complete with basic tools and materials used in the pipe trades, and to instruction from an individual with journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter).

Outcomes: The student will:

1. **construct threaded and grooved piping system components**
   - 1.1 identify types, markings, designations, temperature, and pressure ratings of ferrous pipe and fittings
   - 1.2 identify applications of codes, regulations, and manufacturer's specifications
   - 1.3 describe the composition of ferrous, alloyed, and non-ferrous pipe
   - 1.4 calculate cut length for threaded and grooved pipe
   - 1.5 describe the fabrication steps for threading and grooving pipe
   - 1.6 demonstrate the use of hand tools to thread and groove pipe
   - 1.7 demonstrate the use of power tools to thread and groove pipe
   - 1.8 assemble and pressure test an assigned project
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 PLA3426: TUBES, TUBING, AND VALVES

Level: First Period Apprenticeship

Prerequisite: PLA3900: Apprenticeship Safety

Description: Students develop an understanding of tubes, tubing systems, and valves.

Parameters: Access to a materials work centre, complete with basic tools and materials used in the pipe trades, and to instruction from an individual with journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter).

Outcomes: The student will:

1. construct tube and tubing system components
- 1.1 identify types, designations, and pressure ratings
- 1.2 identify fitting types and joining techniques
- 1.3 identify applications and manufacturer's specifications pertaining to joining methods
- 1.4 identify application to health and safety issues pertaining to joining methods
- 1.5 describe the process for bending tubing
- 1.6 describe the fabrication process pertaining to joining methods
- 1.7 assemble and pressure test an assigned project including flared, compression joints, and bending components

2. install valves in piping systems
- 2.1 identify types of valves
- 2.2 describe major design variations of valves and their applications
- 2.3 describe service and maintenance procedures of valves
- 2.4 explain the purpose of manufacturer's instructions

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 PLA3431: INSTALL AND TEST PIPING SYSTEMS

Level: First Period Apprenticeship

Prerequisite: PLA3900: Apprenticeship Safety

Description: Students develop an understanding of pressure testing and pumps and install hangers, supports, and fasteners.

Parameters: Access to a materials work centre, complete with basic tools and materials used in the pipe trades, and to instruction from an individual with journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter).

Outcomes: The student will:

1. **install hangers, supports, and fasteners for piping systems**
   - 1.1 identify types of hangers, supports, and fasteners
   - 1.2 describe applications of hangers, supports, and fasteners
   - 1.3 describe installation techniques for hangers, supports, and fasteners
   - 1.4 explain specifications and manufacturer's requirements for hangers, supports, and fasteners
2. **pressure test a piping system**
   - 2.1 identify equipment used for pressure testing piping installations
   - 2.2 describe procedures and requirements for pneumatic and hydrostatic testing
   - 2.3 describe hazards specific to pressure testing
3. **describe pumps for piping systems**
   - 3.1 identify types of pumps
   - 3.2 describe differences in pumps
   - 3.3 describe factors affecting the operation of a pump
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 PLA3436: WELDING SAFETY AND FABRICATION

Level: First Period Apprenticeship

Prerequisite: PLA3900: Apprenticeship Safety

Description: Students develop an understanding of welding equipment and the basics of welding.

Parameters: Access to a materials work centre, complete with basic tools and materials used in the pipe trades, and to instruction from an individual with journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter).

Outcomes: The student will:

1. **apply safe work practices according to *Occupational Health and Safety Act* (OHS) legislation**
   - 1.1 identify hazards for welding and cutting operations
   - 1.2 identify personal protective equipment for welding and cutting operations
   - 1.3 explain hazards involved with welding fumes and gases
   - 1.4 identify welding fume ventilation methods
   - 1.5 explain effects of electricity and describe precautions used to prevent injury
   - 1.6 describe procedures for welding or cutting in confined spaces
   - 1.7 interpret general safety regulations in the *Occupational Health and Safety Act*
2. **use oxyfuel and arc welding equipment**
   - 2.1 identify five basic joint types
   - 2.2 describe types of welds and their required dimensions
   - 2.3 identify types of metals using practical tests
   - 2.4 identify and use oxyfuel cutting equipment
   - 2.5 identify and use arc welding equipment
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 PLA3441: BRACKET AND SPOOL FABRICATION

Level: First Period Apprenticeship

Prerequisite: PLA3436: Welding Safety and Fabrication

Description: Students fabricate a bracket project and a spool project to demonstrate an understanding of how to weld.

Parameters: Access to a materials work centre, complete with basic tools and materials used in the pipe trades, and to instruction from an individual with journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter).

Outcomes: The student will:

1. **use oxyfuel and arc welding equipment**
   - 1.1 build a bracket project
   - 1.2 build a spool project
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 PLA3446: BRAZING AND SOLDERING

Level: First Period Apprenticeship

Prerequisite: PLA3436: Welding Safety and Fabrication

Description: Students develop and demonstrate an understanding of brazing and soldering metal alloys.

Parameters: Access to a materials work centre, complete with basic tools and materials used in the pipe trades, and to instruction from an individual with journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter).

Outcomes: The student will:

1. **braze and solder metal alloys**
   - 1.1 identify applications of brazed and soldered joints
   - 1.2 identify equipment and materials required to braze and solder
   - 1.3 describe brazing and soldering procedures
   - 1.4 assemble and test an assigned project
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 PLA3451: SKETCHING AND DRAWING

Level: First Period Apprenticeship

Prerequisite: PLA3900: Apprenticeship Safety

Description: Students develop an understanding of drafting and the use of single-line drawings. Students demonstrate orthographic drawing and isometric single-line drawing.

Parameters: Access to a materials work centre, complete with basic tools and materials used in the pipe trades, and to instruction from an individual with journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter).

Outcomes: The student will:

1. **apply sketching and drawing concepts**
   - 1.1 identify the types of drafting equipment
   - 1.2 explain the use of drafting equipment
   - 1.3 identify the types of drafting lines found on a drawing
   - 1.4 identify the three views of an orthographic projection
   - 1.5 draw and label the three views of an orthographic drawing
2. **develop single-line pipe drawings**
   - 2.1 identify piping symbols
   - 2.2 draw and label orthographic single-line drawings
   - 2.3 draw and label isometric single-line piping drawings
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 PLA3456: INTERPRETING DRAWINGS

Level: First Period Apprenticeship

Prerequisite: PLA3451: Sketching and Drawing

Description: Students interpret architectural drawings and mechanical drawings used in the pipe trades.

Parameters: Access to a materials work centre, complete with basic tools and materials used in the pipe trades, and to instruction from an individual with journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter).

Outcomes: The student will:

1. **interpret drawings**
   - 1.1 identify the views of a drawing
   - 1.2 explain the usage of scales
   - 1.3 calculate dimensions using imperial scales and metric scales
   - 1.4 describe symbols found on a drawing
   - 1.5 identify the five divisions of a drawing package
   - 1.6 describe the purpose of drawing divisions
   - 1.7 identify architectural drawings and mechanical drawings
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 PLA3461: PIPE TRADES CALCULATIONS

Level: First Period Apprenticeship

Prerequisite: PLA3900: Apprenticeship Safety

Description: Students identify and demonstrate basic mathematic calculations used in the pipe trades.

Parameters: Access to a materials work centre, complete with basic tools and materials used in the pipe trades, and to instruction from an individual with journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter).

Outcomes: The student will:

1. **apply mathematical skills using both metric measurements and imperial measurements**
   - 1.1 perform arithmetic calculations using whole numbers, fractions, and decimals
   - 1.2 describe the metric and imperial measurement systems
   - 1.3 describe the operation of the AIT calculator, which is provided to students for exams administered by AIT
   - 1.4 perform number conversions using whole numbers, fractions, and decimals
   - 1.5 perform measurement conversions using whole numbers, fractions, and decimals
2. **solve mathematical problems involving perimeter, areas, percentage, and grade**
   - 2.1 identify concepts used when working with formulas
   - 2.2 apply formulas for calculating perimeters of rectangles, triangles, and circles
   - 2.3 apply formulas for calculating the surface area of regular-shaped solids, tanks, and cylinders
   - 2.4 apply the formula for calculating percentages
   - 2.5 calculate grades in percentage, fractions, and ratio
3. **calculate volumetric capacities for tanks and cylinders**
   - 3.1 apply formulas for calculating volumes of regular-shaped solids, tanks, and cylinders
   - 3.2 calculate the capacity of regular-shaped tanks and cylinders using both metric values and imperial values
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 PLA3466: PIPING OFFSETS AND DENSITY

Level: First Period Apprenticeship

Prerequisite: PLA3461: Pipe Trades Calculations

Description: Students describe and demonstrate piping offset and density calculations used in the pipe trades.

Parameters: Access to a materials work centre, complete with basic tools and materials used in the pipe trades, and to instruction from an individual with journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter).

Outcomes: The student will:

1. **calculate 45° and 90° offsets for piping systems**
   - 1.1 calculate offsets for right angle triangles
   - 1.2 apply formulas for 45° and 90° offsets
   - 1.3 calculate offset dimensions around an object
2. **calculate mass, volumes, densities, and relative densities**
   - 2.1 define the terms matter, element, compound, and mixture
   - 2.2 describe the three common states of matter
   - 2.3 define the terms adhesion, cohesion, surface tension, and capillarity
   - 2.4 calculate density, mass, and volume of substances
   - 2.5 calculate mass and density using relative densities
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 PLA3471: PRINCIPLES OF PRESSURE, ATMOSPHERE, AND ELECTRICITY

Level: First Period Apprenticeship

Prerequisite: PLA3466: Piping Offsets and Density

Description: Students understand and apply the principles of pressure, atmosphere, and electricity used in the pipe trades. Students calculate pressures and perform electrical calculations.

Parameters: Access to a materials work centre, complete with basic tools and materials used in the pipe trades, and to instruction from an individual with journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter).

Outcomes: The student will:

1. calculate pressures in metric values and imperial values
- 1.1 define pressure and force
- 1.2 state the six principles of hydrostatics
- 1.3 define pressure constants used for calculating pressures
- 1.4 perform pressure and force calculations in both metric units and imperial units
- 1.5 describe atmospheric pressure and the effect of altitude
- 1.6 perform calculations to convert absolute, gauge, and mercury pressures

2. perform electrical calculations
- 2.1 identify principles of electricity, including direct current and alternating current flow, electrolysis, and electromagnetism
- 2.2 sketch series and parallel electrical circuits
- 2.3 perform calculations using Ohm's law

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 PLA3480: PLA 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 journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter) or an experienced professional with the same 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 PLA3485: PLA 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 journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter) or an experienced professional with the same 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 PLA3490: PLA 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 journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter) or an experienced professional with the same 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 PLA3495: PLA 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 in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter) or an experienced professional with the same 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 PLA3900: APPRENTICESHIP SAFETY

Level: First Period Apprenticeship

Prerequisite: None

Description: Students develop the knowledge and skills required to maintain a personal health and safety plan; identify the steps for obtaining a journeyperson certificate; and describe how to apply legislation, regulations, and practices of the industry. Students also learn to use the codes and standards that are applied in the pipe trades.

Parameters: Access to a materials work centre, complete with basic tools and materials used in the pipe trades, and to instruction from an individual with journeyperson certification in any of the pipe trades (i.e., gasfitter, plumber, sprinkler systems installer, and steamfitter-pipefitter).

Outcomes: The student will:

1. **apply legislation, regulations, and practices ensuring safe work in the pipe trades**
   - 1.1 demonstrate the application of the *Occupational Health and Safety Act*, *Regulation,* and *Code*
   - 1.2 describe the employer's and employee's role with Occupational Health and Safety (OHS) regulations, Worksite Hazardous Materials Information Systems (WHMIS), fire regulations, Workers' Compensation Board regulations, and related advisory bodies and agencies
   - 1.3 describe Alberta's *Public Health Act* and the Personal Services Regulation as it pertains to the pipe trades
   - 1.4 describe industry practices for hazard assessment and control procedures
   - 1.5 describe the responsibilities of workers and employers to apply emergency procedures
   - 1.6 describe tradesperson attitudes with respect to housekeeping, personal protective equipment (PPE), and emergency procedures
   - 1.7 describe the roles and responsibilities of employers and employees with the selection and use of PPE
   - 1.8 select, use, and maintain appropriate PPE for worksite applications
   - 1.9 use required PPE for tasks
2. **use industry standard practices for climbing, lifting, rigging, and hoisting in the pipe trades**
   - 2.1 describe manual lifting procedures
   - 2.2 describe rigging hardware and associated safety factors
   - 2.3 describe industry-related body mechanics
   - 2.4 select equipment for rigging loads
   - 2.5 describe hoisting and load moving procedures
   - 2.6 maintain PPE for climbing, lifting, and load moving equipment
   - 2.7 practise workplace ergonomics
   - 2.8 use PPE for climbing, lifting, and load moving equipment
3. **apply industry standard practices for hazardous materials and fire protection in the pipe trades**
   - 3.1 describe roles, responsibilities, features, and practices related to the WHMIS program
   - 3.2 describe three key elements of WHMIS
   - 3.3 describe handling, storing, and transporting procedures for hazardous material

3.4 describe venting procedures when working with hazardous materials
3.5 describe hazards, classes, procedures, and equipment related to fire protection

4. manage an apprenticeship to earn journeyperson certification

4.1 describe the contractual responsibilities of the apprentice, employer, and Alberta Apprenticeship and Industry Training
4.2 describe the purpose of the apprentice record book
4.3 describe the procedure for changing employers during an active apprenticeship
4.4 describe the purpose of the course outline
4.5 describe the procedure for progressing through an apprenticeship
4.6 describe advancement opportunities in this trade

5. use codes and standards that are applied in the pipe trades

5.1 identify code documents relating to pipe trades, including ASME/ABSA, CSA, NRC, NFPA, and ASHRAE
5.2 explain the applicable codes and standards and which body governs the code or standard
5.3 describe the procedures for the acceptance of the codes by the provinces and the local authorities

6. apply arc flash safety and lockout and tagout on a jobsite

6.1 identify safe-work practices to protect from arc flash hazards
6.2 describe lockout and tagout procedures
6.3 identify safe-work practices to prevent electrical shock

7. demonstrate basic competencies

7.1 demonstrate fundamental skills to:
- 7.1.1 communicate
- 7.1.2 manage information
- 7.1.3 use numbers
- 7.1.4 think and solve problems

7.2 demonstrate personal management skills to:
- 7.2.1 demonstrate positive attitudes and behaviours
- 7.2.2 be responsible
- 7.2.3 be adaptable
- 7.2.4 learn continuously
- 7.2.5 work safely

7.3 demonstrate teamwork skills to:
- 7.3.1 work with others
- 7.3.2 participate in projects and tasks

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

8.1 identify short-term and long-term goals
8.2 identify steps to achieve goals