
NL Curriculum Standard Plan of Training Insulator (Heat and Frost)



Government of Newfoundland and Labrador
Department of Immigration, Skills and Labour
Apprenticeship and Trades Certification Division

March 2019

PLAN OF TRAINING

Insulator (Heat and Frost)

March, 2019



**Government of Newfoundland and Labrador
Department of Advanced Education, Skills and Labour
Apprenticeship and Trades Certification Division**

Approved by:

A handwritten signature in blue ink, appearing to read "Dave Li".

Chairperson, Provincial Apprenticeship and Certification Board

Date: March 20, 2019

Preface

This curriculum standard is aligned with the 2018 edition of the Red Seal Occupational Standard (RSOS) and National Harmonization sequencing for the Insulator (Heat and Frost) trade. It describes the curriculum content for the Insulator (Heat and Frost) apprenticeship training program.

Acknowledgements

The Provincial Trade Advisory Committee (PTAC), industry representatives, instructors and apprenticeship staff provided valuable input to the development of this provincial plan of training. Without their dedication to quality apprenticeship training, this document could not have been produced.

We offer a sincere thank you.

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Plan of Training – Insulator (Heat and Frost)

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New	March 2019	September 2019 - Pre-Employment	Aligns with 2018 RSOS and National Harmonization sequencing
		January 2020 - Level 2	
		September 2021 - Level 3	
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A. RSOS Comparison Chart

2018 RSOS Tasks and Sub-Task		2019 Plan of Training	
Task 1 – Safety-Related Functions			
1.01	Uses personal protective equipment (PPE) and safety equipment	HF1121	Safety throughout all levels
1.02	Maintains safe work environment		
Task 2 – Uses and Maintains Tools and Equipment			
2.01	Uses tools and equipment	HF1103	Tools and Equipment throughout all levels
2.02	Uses access equipment		
Task 3 – Organizes Work			
3.01	Performs task scheduling	HF1130	Work Scheduling and Materials
3.02	Organizes materials on site		
Task 4 – Communication and Mentoring Techniques			
4.01	Uses communication techniques	CM2161	Communication Essentials
4.02	Uses mentoring techniques	HF4120	Mentoring
Task 5 – Routine Trade Practices			
5.01	Performs measurements and calculations	HF1140	Trade Practices
5.02	Interprets measurements and calculations	HF2010	Tank, Vessel and Equipment Insulation I
5.03	Prepares substrates	HF2070	Sealers, Coatings and Spray-On Insulation
		HF1271	Blueprints I
		HF2040	Mechanical Equipment Insulation I
		HF3271	Blueprint II
		HF2020	Plumbing and Mechanical Piping Insulation II
		HF3030	Tank, Vessel and Equipment Insulation II
		HF3040	Mechanical Ducting Insulation II
		HF2080	Insulating Systems for Refractory Application
		HF2090	Insulating Systems for Cryogenic Application
		HF4070	Fire Stop System Installation II
		HF4080	Fireproofing Installation II
		HF3060	Removable Cover Installation

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2018 RSOS Tasks and Sub-Task		2019 Plan of Training	
			(Soft Cover)
		HF4100	Triangulation
		HF4041	Transitions and Reducers
		HF1140	Trade Practices
Task 6 – Prepares for Installations of Insulation in Industrial Applications			
6.01	Selects materials for industrial applications	HF1160	Industrial Applications (Preparation)
		HF2010	Tank, Vessel and Equipment Insulation I
		HF2040	Mechanical Equipment Insulation I
		HF2070	Sealers, Coatings and Spray-On Insulation
		HF3030	Tank, Vessel and Equipment Insulation II
		HF3050	Mechanical Equipment Insulation II
		HF3060	Removable Cover Installation (Soft Cover)
		HF3070	Marine Applications
		HF3271	Blueprints II
		HF1190	Fire Stop Installation I
		HF1430	Fireproofing Installation I
		HF4070	Fire Stop Installation II
		HF4080	Fireproofing Installation II
		HF4090	Removable Cover Installation (Hard Cover)
		HF4100	Triangulation
		HF4041	Transitions and Reducers
		HF2080	Insulating Systems for Refractory Application
HF2090	Insulation Systems for Cryogenic Application		
HF2060	Underground Insulating System Installation		
6.02	Performs layout for industrial applications	HF1160	Industrial Application (Preparation)
		HF2010	Tank, Vessel and Equipment Insulation I

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2018 RSOS Tasks and Sub-Task		2019 Plan of Training	
		HF2040	Mechanical Equipment Insulation I
		HF2070	Sealers, Coatings and Spray-On Insulation
		HF3271	Blueprint II
		HF3030	Tank, Vessel and Equipment Insulation II
		HF3050	Mechanical Equipment Insulation II
		HF3060	Removable Cover Installation (Soft Cover)
		HF4090	Removable Cover Installation (Hard Cover)
		HF4100	Triangulation
		HF4041	Transitions and Reducers
		HF2080	Insulating Systems for Refractory Application
		HF2090	Insulating Systems for Cryogenic Application
		HF2060	Underground Insulating System Installation
Task 7 – Insulates Piping and Fittings			
7.01	Installs insulation on piping, fittings and hangers	HF1222	Piping and Fitting Insulation I
7.02	Applies vapour barrier on piping and fittings		
7.03	Installs cladding, jacketing and finishes on piping and fittings	HF1222	Piping and Fitting Insulation II
		HF4090	Removable Cover Installation (Hard Cover)
		HF4070	Fire Stop System Installation II
Task 8 – Insulates Tanks, Vessels and Equipment			
8.01	Installs insulations on tanks, vessels and equipment	HF2010	Tank, Vessel and Equipment Insulation I
8.02	Applies vapour barrier on tanks, vessels and equipment		
8.03	Installs cladding, jacketing and finishes on tanks, vessels and equipment	HF3030	Tank, Vessel and Equipment Insulation II
Task 9 – Prepares for Installation of Insulation in Commercial Applications			
9.01	Selects materials for	HF1170	Commercial Applications

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2018 RSOS Tasks and Sub-Task		2019 Plan of Training	
	commercial applications		(Preparation)
		HF2020	Plumbing and Mechanical Piping Insulation II
		HF2040	Mechanical Ducting Insulation I
		HF3040	Mechanical Ducting Insulation II
		HF3040	Mechanical Equipment Insulation II
		HF1271	Blueprint I
		HF3271	Blueprints II
		HF3070	Marine Applications
9.02	Performs layout for commercial applications	HF1170	Commercial Applications (Preparation)
		HF2020	Plumbing and Mechanical Piping Insulation II
		HF2040	Mechanical Ducting Insulation I
		HF3040	Mechanical Ducting Insulation II
		HF1271	Blueprint I
		HF3271	Blueprints II
		HF3050	Mechanical Equipment Insulation II
Task 10 – Insulates Plumbing Systems and Mechanical Piping Systems			
10.01	Installs insulation on plumbing and mechanical piping systems	HF1180	Plumbing and Mechanical Piping System Insulation I
10.02	Applies vapour barrier on insulated plumbing and mechanical piping systems	HF1180	Plumbing and Mechanical Piping System Insulation I
10.03	Installs cladding, jacketing and finishes on insulated plumbing and mechanical piping systems	HF2020	Plumbing and Mechanical Piping System Insulation II
Task 11 – Insulates Mechanical Ducting			
11.01	Installs insulation on mechanical ducting	HF2030	Mechanical Ducting Insulation I
11.02	Applies vapour barrier on insulated mechanical ducting		
11.03	Installs cladding, jacketing and finishes on insulated mechanical ducting	HF3040	Mechanical Ducting Insulation II
Task 12 – Insulates Mechanical Equipment			

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2018 RSOS Tasks and Sub-Task		2019 Plan of Training	
12.01	Installs insulation on mechanical equipment	HF2040	Mechanical Equipment Insulation I
12.02	Applies vapour barrier on insulated mechanical equipment		
12.03	Installs cladding, jacketing and finishes on insulated mechanical equipment	HF3050	Mechanical Equipment Insulation II
Task 13 – Installs Fire Stop Systems			
13.01	Identifies approved fire stop system	HF1190 HF4070	Fire Stop System Installation I Fire Stop System Installation II
13.02	Applies fire stop materials to architectural, structural, mechanical and electrical components		
Task 14 – Insulates for Soundproofing			
14.01	Insulates piping for soundproofing	HF2050	Soundproofing Insulation
14.02	Insulates turbines, equipment and mechanical systems for soundproofing		
14.03	Fabricates acoustic panels		
14.04	Installs acoustic panels to ceilings and walls		
Task 15 – Installs Removable Covers			
15.01	Fabricates removable covers	HF3060 HF4090	Removable Cover Installation (Soft Cover) Removable Cover Installation (Hard Cover)
15.02	Fastens removable covers		
Task 16 – Installs Underground Insulating Systems			
16.01	Installs pipe insulation to underground systems	HF2060	Underground Insulating System Installation
16.02	Installs pour-in-place and spray-on insulations to underground systems		

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2018 RSOS Tasks and Sub-Task		2019 Plan of Training	
Task 17 – Spray Sealers, Coatings and Spray-On Insulations			
17.01	Protects surrounding work area for spraying	HF2070	Sealers, Coatings and Spray-On Insulation
17.02	Prepares materials, equipment and substrate for spraying		
17.03	Installs reinforcing material for spraying		
17.04	Applies spray-on insulation, coatings and sealers		
Task 18 – Installs Fireproofing			
18.01	Applies fireproofing to architectural, structural, mechanical and electrical components	HF1430	Fireproofing Installation I
18.02	Applies protective covering to fireproofing materials	HF4080	Fireproofing Installation II
Task 19 – Installs Insulations for Refractory Systems			
19.01	Applies insulation to refractory systems	HF2080	Insulating Systems for Refractory Application
19.02	Installs reflective systems		
19.03	Installs cladding, jacketing and finishes to refractory systems		
Task 20 – Installs Insulation for Cryogenic Systems			
20.01	Applies insulation to cryogenic systems	HF2090	Insulating Systems for Cryogenic Application
20.02	Applies vapour barrier to insulated components of cryogenic systems		
20.03	Installs cladding, jacketing and finishes to cryogenic systems		

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2018 RSOS Tasks and Sub-Task		2019 Plan of Training	
Task 21 – Insulates for Marine Applications (Not Common Core)			
21.01	Insulates bulkheads, deckheads and hulls	HF3070	Marine Applications
21.02	Installs cladding, jacketing and finishes on marine applications		
Task 22 – Performs Asbestos, Lead and Mould Abatement			
22.01	Determines required personal protective equipment (PPE) for asbestos abatement	HF1256	Asbestos Abatement (Preparation)
22.02	Retrieves sample of asbestos for testing		
22.03	Determines scope of work		
22.04	Prepares site for removal and containment of asbestos		
22.05	Builds temporary enclosure		
Task 23 – Performs Asbestos Removal Procedures			
23.01	Removes asbestos	HF1440	Asbestos Removal
23.02	Disposes of asbestos materials		
23.03	Performs decontamination of area and equipment		
Task 24 – Performs Maintenance and Repair.			
24.01	Encapsulates asbestos	HF1450	Asbestos Maintenance and Repair
24.02	Encloses asbestos		
Task 25 – Performs Lead Abatement and Mould Remediation.			
25.01	Performs lead abatement	HF1460	Lead Abatement and Mould Remediation
25.02	Performs mould remediation		

B. Program Structure

For each and every course, a formal assessment is required for which 70% is the pass mark. A mark of 70% must be attained in both the theory examination and the practical project assignment, where applicable as documented on an official transcript.

The order of course delivery within each block can be determined by the training institution, as long as pre-requisite conditions are satisfied.

Upon completion of an entry level program, individuals may be required to complete other certifications (employer or job site specific) in order to gain employment.

A Pre-employment student who becomes an apprentice will also be required to complete Levels 2, 3 & 4 in the NLCS.

Pre-Employment			
Course No.	Course Name	Hours	Pre-Requisite(s)
TS1510	Occupational Health and Safety	6	None
TS1520	WHIMIS	6	None
TS1530	Standard First Aid	14	None
HF1121	Safety	12	None
HF1103	Tools and Equipment	12	HF1121
HF1130	Work Scheduling and Materials	18	HF1121
HF1140	Trade Practices	18	HF1121 AM1101 AM1201
HF1160	Industrial Applications (Preparation)	18	HF1121
HF1222	Piping and Fitting Insulation I	12	HF1121
HF1170	Commercial Applications (Preparation)	24	HF1121 AM1101 AM1201
HF1180	Plumbing and Mechanical Piping System Insulation I	90	HF1121 AM1101 AM1201
HF1190	Fire Stop System Installation I	24	HF1121
HF1430	Fireproofing Installation I	18	HF1121

Pre-Employment			
Course No.	Course Name	Hours	Pre-Requisite(s)
HF1256	Asbestos Abatement (Preparation)	12	HF1121
HF1440	Asbestos Removal	12	HF1121
HF1450	Asbestos Maintenance and Repair	12	HF1121
HF1460	Lead Abatement and Mould Remediation	18	HF1121
HF1271	Blueprints I	24	HF1103 AM1201
AM1000	Introduction to Essential Skills	9	None
AP1102	Introduction to Apprenticeship	12	None
AM1101	Math Essentials	42	None
AM1201	Insulator Math Fundamentals	42	AM1101
CM2161	Communication Essentials	36	None
SD1761	Workplace Essentials	24	None
MC1062	Computer Essentials	15	None
Total Pre-Employment Hours		530	

*A student who can meet the mathematics requirement through an ACUPLACER® test may be exempted from AM1101 - Math Essentials. Please check with your training institution.

Required Work Experience

Level 2			
Course No.	Course Name	Hours	Pre-Requisite(s)
HF2010	Tank, Vessel and Equipment Insulation I	24	Pre-Employment
HF2020	Plumbing and Mechanical Piping System Insulation II	24	
HF2030	Mechanical Ducting Insulation I	24	
HF2040	Mechanical Equipment Insulation I	24	
HF2050	Soundproofing Insulation	24	
HF2060	Underground Insulating System Installation	24	
HF2070	Sealers, Coatings and Spray-On Insulation	24	
HF2080	Insulating Systems for Refractory Application	18	
HF2090	Insulating Systems for Cryogenic Application	24	
Total Level 2 Hours		210	

Required Work Experience

Level 3			
Course No.	Course Name	Hours	Pre-Requisite(s)
HF3020	Piping and Fitting Insulation II	24	Level 2
HF3030	Tank, Vessel and Equipment Insulation II	30	
HF3040	Mechanical Ducting Insulation II	24	
HF3050	Mechanical Equipment Insulation II	24	
HF3060	Removable Cover Installation (Soft Cover)	24	
HF3070	Marine Applications	24	
HF3271	Blueprints II	30	
Total Level 3 Hours		180	

Required Work Experience

Level 4			
Course No.	Course Name	Hours	Pre-Requisite(s)
HF4070	Fire Stop System Installation II	24	Level 3
HF4080	Fireproofing Installation II	24	
HF4090	Removable Cover Installation (Hard Cover)	36	
HF4041	Transitions and Reducers	24	
HF4100	Triangulation	30	
HF4120	Mentoring	6	
HF4110	Program Review	30	
Total Level 4 Hours		174	
Total Course Credit Hours		1094	

Pre-Employment

TS1510 Occupational Health and Safety

Learning Outcomes:

- Demonstrate knowledge of interpreting the Occupational Health and Safety Act, laws and regulations.
- Demonstrate knowledge of understanding the designated responsibilities within the laws and regulations such as the right to refuse dangerous work; and the importance of reporting accidents.
- Demonstrate knowledge of how to prevent accidents and illnesses.
- Demonstrate knowledge of how to improve health and safety conditions in the workplace.

Duration: 6 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Interpret the Occupational Health and Safety Act laws and regulations.
 - i. explain the scope of the act
 - application of the Act
 - Federal/Provincial jurisdictions
 - Canada Labour Code
 - rules and regulations
 - private home application
 - conformity of the Crown by the Act
2. Explain responsibilities under the Act and Regulations.
 - i. duties of employer, owner, contractors, sub-contractors, employees, and suppliers
3. Explain the purpose of joint health and safety committees.
 - i. formation of committee
 - ii. functions of committee
 - iii. legislated rights
 - health and safety representation
 - iv. reporting endangerment to health
 - v. appropriate remedial action
 - vi. investigation of endangerment
 - vii. committee recommendation
 - viii. employer's responsibility in taking remedial action

4. Examine right to refuse dangerous work.
 - i. reasonable grounds for refusal
 - ii. reporting endangerment to health
 - iii. appropriate remedial action
 - iv. investigation of endangerment
 - v. committee recommendation
 - vi. employer's responsibility to take appropriate remedial action
 - vii. action taken when employee does not have reasonable grounds for refusing dangerous work
 - viii. employee's rights
 - ix. assigning another employee to perform duties
 - x. temporary reassignment of employee to perform other duties
 - xi. collective agreement influences
 - xii. wages and benefits
5. State examples of work situations where one might refuse work.
6. Describe discriminatory action.
 - i. definition
 - ii. filing a complaint procedure
 - iii. allocated period of time a complaint can be filed with the Commission
 - iv. duties of an arbitrator under the Labour Relations Act
 - v. order in writing inclusion
 - vi. report to commission allocated period of time to request arbitrator to deal with the matter of the request
 - vii. notice of application
 - viii. failure to comply with the terms of an order
 - ix. order filed in as the court
7. Explain duties of commission officers.
 - i. powers and duties of officers
 - ii. procedure for examinations and inspections
 - iii. orders given by officers orally or in writing
 - iv. specifications of an order given by an officer to owner of the place of employment, employer, contractor, sub-contractor, employee, or supplier
 - v. service of an order
 - vi. prohibition of persons towards an officer in the exercise of his/her power or duties
 - vii. rescinding of an order
 - viii. posting a copy of the order
 - ix. illegal removal of an order
8. Interpret appeals of others.
 - i. allocated period of time for appeal of an order
 - ii. person who may appeal order

- iii. action taken by commission when person involved does not comply with the order
 - iv. enforcement of the order
 - v. notice of application
 - vi. rules of court
9. Explain the process for reporting of accidents.
- i. application of act
 - ii. report procedure
 - iii. reporting notification of injury
 - iv. reporting accidental explosion or exposure
 - v. posting of act and regulations

Practical Requirements:

- 1. Conduct an interview with someone in your occupation on two or more aspects of the act and report results.
- 2. Conduct a safety inspection of shop area.

TS1520 Workplace Hazardous Materials Information System (WHMIS)

Learning Outcomes:

- Demonstrate knowledge of interpreting and applying the Workplace Hazardous Materials Information System (WHMIS) regulation under the Occupational Health and Safety Act.

Duration: 6 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Define WHMIS safety.
 - i. rationale and key elements
 - ii. history and development of WHMIS
 - iii. WHMIS legislation
 - iv. WHMIS implementation program
 - v. definitions of legal and technical terms

2. Examine hazard identification and ingredient disclosure.
 - i. prohibited, restricted and controlled products
 - ii. classification and the application of WHMIS information requirements
 - iii. responsibilities for classification
 - the supplier
 - the employer
 - the worker - Classification: rules and criteria
 - information on classification
 - classes, divisions and subdivision in WHMIS
 - general rules for classification
 - class A - compressed gases
 - class B - flammable and combustible materials
 - class C - oxidizing material
 - class D - poisonous and infectious material
 - class E - corrosive material
 - class F - dangerously reactive material
 - iv. products excluded from the application of WHMIS legislation
 - consumer products
 - explosives
 - cosmetics, drugs, foods and devices
 - pest control products
 - radioactive prescribed substances

- wood or products made of wood
 - manufactured articles
 - tobacco or products of tobacco
 - hazardous wastes
 - products handled or transported pursuant to the Transportation of Dangerous Goods (TDG) Act
- v. comparison of classification systems – WHMIS and TDG
- vi. general comparison of classification categories
- vii. detailed comparison of classified criteria
3. Explain labeling and other forms of warning.
- i. definition of a WHMIS label
 - supplier label
 - workplace label
 - other means of identification
 - ii. responsibility for labels
 - supplier responsibility
 - employer responsibility
 - worker responsibility
 - iii. introduce label content, design and location
 - supplier labels
 - workplace labels
 - other means of identification
4. Introduce material safety data sheets (MSDS).
- i. definition of a material safety data sheet
 - ii. purpose of the data sheet
 - iii. responsibility for the production and availability of data sheets
 - supplier responsibility
 - employer responsibility
 - workers responsibility

Practical Requirements:

1. Locate WHMIS label and interpret the information displayed.
2. Locate a MSDS sheet for a product used in the workplace and determine what personal protective equipment and other precautions are required when handling this product.

TS1530 Standard First Aid

Learning Outcomes:

- Demonstrate knowledge of recognizing situations requiring emergency action
- Demonstrate knowledge of making appropriate decisions concerning first aid

Duration: 14 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Complete a **St. John Ambulance or Canadian Red Cross** Standard First Aid Certificate course.

HF1121 Safety

Learning Outcomes:

- Demonstrate knowledge of PPE and safety equipment, their applications, and procedures for use.
- Demonstrate knowledge of safe work practices.
- Demonstrate knowledge of regulations pertaining to PPE and safety equipment.
- Demonstrate knowledge of regulations pertaining to safety.

Duration: 12 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Identify types of personal protective equipment (PPE) and describe their applications, and procedures for use.
 - i. eye protection
 - ii. gloves
 - iii. boots
 - iv. respirators
 - v. hearing protection
 - vi. fall protection equipment
 - vii. hard hats
 - viii. wristlets
 - ix. coveralls
2. Identify types of safety equipment and describe their applications and procedures for use.
 - i. warning tapes
 - ii. first aid kits
 - iii. eye wash stations
 - iv. fire extinguishers
3. Identify the procedures used to inspect, maintain and store PPE and safety equipment.
4. Identify jurisdictional health and safety acts and regulations pertaining to PPE and safety equipment.

5. Identify hazards and describe safe work practices.
 - i. pinch points
 - ii. tripping hazards
 - iii. chemical hazards
 - iv. electric shock hazards
 - v. burn hazards
 - vi. noise hazards
 - vii. height hazards
 - viii. respiratory hazards
 - ix. environmental hazards

6. Identify company policies and procedures pertaining to safe work practices.
 - i. evacuation routes
 - ii. muster stations
 - iii. warning signals
 - iv. incident procedures
 - v. emergency phone numbers
 - vi. location of safety equipment
 - vii. lock-out procedures

7. Describe safety watch requirements.
 - i. fire watch
 - ii. man watch
 - iii. bottle watch

8. Identify company or site-specific safety training requirements.
 - i. fall protection
 - ii. confined space entry
 - iii. asbestos awareness
 - iv. Workplace Hazardous Materials Information System (WHMIS)
 - v. H2S awareness
 - vi. rigging and hoisting
 - vii. lift training
 - viii. lock-out procedures

9. Describe housekeeping practices related to safe work practices.

10. Identify required work permits.
 - i. confined space
 - ii. hot work
 - iii. safe work
 - iv. cold work
 - v. blanket (general access)

11. Identify and implement jurisdictional health and safety acts and regulations pertaining to safe work practices.

Practical Requirements:

None.

HF1103 Tools and Equipment

- Demonstrate knowledge of tools and equipment, their applications, maintenance and procedures for use.
- Demonstrate knowledge of access equipment, their applications, maintenance and procedures for use.

Duration: 12 Hours

Pre-Requisite(s): HF1121

Objectives and Content:

1. Identify types of tools and equipment, and describe their application and procedures for use.
2. Identify hazards and describe safe work practices pertaining to the use of tools and equipment.
3. Identify types of access equipment, and describe their application and procedures for use.
 - i. step ladders
 - ii. extension ladders
 - iii. aerial platforms
 - iv. scissor lifts
 - v. crane baskets
 - vi. scaffolding
 - vii. rope access equipment
4. Identify hazards and describe safe work practices pertaining to the use of access equipment.
5. Implement codes and regulations pertaining to the use of access equipment.
6. Describe the procedures used to inspect and maintain access equipment.
7. Identify jurisdictional regulations, limitations and training requirements for access equipment.
8. Describe the procedures used to erect, level and dismantle scaffolding.
9. Describe the procedures used to store and secure access equipment.

Practical Requirements:

1. Use and maintain various types of hand and power tools.

HF1130 Work Scheduling and Materials

Learning Outcomes:

- Demonstrate knowledge of the procedures to plan and schedule tasks.
- Demonstrate knowledge of procedures used to organize materials on site.

Duration: 18 Hours

Pre-Requisite(s): HF1121

Objectives and Content:

1. Identify factors to consider when planning and scheduling daily tasks.
 - i. project requirements
 - ii. safety considerations
 - iii. field-level risk assessments
 - iv. contractors' requirements
 - v. environmental conditions
 - vi. work in progress (WIP) log
2. Identify sequence of task activities.
3. Describe procedures for coordinating work tasks with other trades.
4. Identify work order, work release and safe work permit procedures.
5. Identify types, sizes and amounts of materials required for each project.
6. Identify designated areas for storage of materials.
7. Identify designated areas for disposal of waste materials.
8. Identify factors to consider for storing materials and describe storage procedures.
 - i. requirements of daily tasks
 - ii. environmental factors
 - iii. sequence of retrieval
 - iv. weight
9. Describe procedures used to secure materials.
10. Describe procedures used to dispose of waste materials.

Practical Requirements:

1. Tie a knot using basic rigging applications to lift materials safely.

HF1140 Trade Practices

Learning Outcomes:

- Demonstrate knowledge of measurements and calculations.
- Demonstrate knowledge of specifications, types of drawings and drawing components.
- Demonstrate knowledge of substrates and the procedures used to prepare them for installation of insulation.

Duration: 18 Hours

Pre-Requisite(s): HF1121, AM1101, AM1201

Objectives and Content:

1. Identify mathematical formulas (surface area, volume, circumference, diameter, radius) for calculating dimensions of components.
 - i. insulation
 - ii. protective finishes
 - iii. cladding/jacketing
 - iv. removable covers
 - v. insulation blankets
2. Identify imperial and metric systems and the conversion from one to the other.
3. Identify types of substrate material, and the methods used to prepare them.
 - i. steel
 - ii. copper
 - iii. galvanized metal
 - iv. iron
 - v. stainless steel
 - vi. glass
 - vii. plastic
 - viii. fiberglass
 - ix. aluminum
4. Identify compatibility of insulating material and substrate based on factors.
 - i. temperature ranges
 - ii. age
 - iii. environment
 - iv. oxidization
 - v. chemical corrosion

5. Identify types of protrusions, penetrations and irregularities in the substrate.
6. Describe substrate preparation techniques for installation of insulation.

Practical Requirements:

None.

HF1160 Industrial Applications (Preparation)

Learning Outcomes:

- Demonstrate knowledge of material selection for industrial applications.
- Demonstrate knowledge of layout procedures for industrial applications.

Duration: 18 Hours

Pre-Requisite(s): HF1121

Objectives and Content:

1. Identify types of materials, their application and procedures for use.
2. Locate information pertaining to materials in drawings or specifications.
3. Identify the factors to consider for selecting cladding.
 - i. reaction to the environment and other materials that are in contact with the cladding
 - ii. finished size of insulation
 - iii. specifications
4. Identify layout tools and their procedures for use.
 - i. dividers
 - ii. squares
 - iii. tape measures
 - iv. calculators
 - v. scratch awls
 - vi. markers
 - vii. trammel points
5. Explain calculation used to develop a layout.
 - i. gores
 - ii. head segments
 - iii. transitions
 - iv. tees
 - v. flashing
 - vi. end caps
6. Describe procedures used to perform a layout for industrial applications.

Practical Requirements:

None.

HF1222 Piping and Fitting Insulation I

Learning Outcomes:

- Demonstrate knowledge of procedures used to install insulation on piping, fittings and hangers.
- Demonstrate knowledge of vapour barriers, their application and the procedures used for installation.

Duration: 12 Hours

Pre-Requisite(s): HF1121

Objectives and Content:

1. Identify types of piping (stainless, copper, iron, plastic, fiberglass), fittings (valves, tees, transitions, elbows), hangers (shoes, sleeves, clevises) and application of pipe insulation.
 - i. fiberglass
 - ii. calcium silicate
 - iii. cellular glass
 - iv. urethane
 - v. mineral fibre
 - vi. elastomeric foam
2. Identify specifications and describe their application to the installation of insulation.
 - i. scope of work
 - ii. operating temperature
 - iii. insulation thickness
 - iv. requirements
3. Describe the results of poor fitting pipe insulation.
 - i. energy loss
 - ii. frost build up
 - iii. personal injury (burns from excess heat or frost)
4. Describe insulation application techniques.
5. Identify fastening devices and techniques.
6. Describe expansion and contraction joint fabrication.

7. Describe the procedures used to install insulation on piping, fittings and hangers.
8. Identify types of vapour barriers and describe their characteristics and applications.
9. Describe the importance of vapour barriers on piping and fittings.
10. Identify types of adhesives and their applications.
11. Describe the procedures used to install vapour barriers on piping and fittings.
12. Identify the hazards and the use of aerogels, pyrogels and cryogels.

Practical Requirements:

None.

HF1170 Commercial Applications (Preparation)

Learning Outcomes:

- Demonstrate knowledge of material selection for commercial applications.
- Demonstrate knowledge of procedures used to lay out materials for commercial applications.

Duration: 24 Hours

Pre-Requisite(s): HF1121, AM1101, AM1201

Objectives and Content:

1. Identify types of insulation, their commercial applications and procedures for use.
 - i. preformed pipe covering
 - ii. fiberglass
 - rigid board
 - flexible blankets / batts
 - iii. mineral fibre
 - iv. elastomeric foam
 - v. insulation cement
2. Identify types of cladding, jacketing and finishes, their commercial applications and procedures for use.
 - i. PVC
 - ii. stainless steel
 - iii. aluminum
 - iv. canvas
 - v. weatherproof membranes
3. Identify types of vapour barriers, their commercial applications and describe their importance and procedures for use.
 - i. RFFRK
 - ii. FSK facing
 - iii. Mastics
 - iv. ASJ
 - v. membrane barriers
 - vi. films
4. Identify hazards of materials and locations as they pertain to selecting materials for commercial applications.
 - i. insulation
 - ii. cladding, jacketing and finishes

- iii. fittings
 - iv. vapour barriers
 - v. soundproofing materials
 - vi. fasteners
 - vii. sealants
- 5. Apply basic geometry related to material selection for commercial applications.
 - 6. Identify materials to be laid out for commercial applications.
 - 7. Apply basic geometry related to layout of materials for commercial applications.
 - 8. Describe procedures used to develop patterns for components.
 - i. tees
 - ii. valves
 - iii. elbows
 - iv. laterals
 - v. square to round
 - vi. gores
 - vii. reducers
 - 9. Describe procedures used to lay out materials for commercial applications.

Practical Requirements:

- 1. Apply various types of insulation, mastic and finishings for commercial application.

HF1180 Plumbing and Mechanical Piping System Insulation I

Learning Outcomes:

- Demonstrate knowledge of procedures used to install insulation on plumbing and mechanical piping systems.
- Demonstrate knowledge of vapour barriers, their characteristics and applications and the procedures used for installation.

Duration: 90 Hours

Pre-Requisite(s): HF1121, AM1101, AM1201

Objectives and Content:

1. Identify plumbing systems, their characteristics and insulation requirements.
 - i. hot
 - ii. cold
 - iii. recirculation water
 - iv. rainwater leaders
 - v. vent piping
 - vi. sanitary drains
2. Identify mechanical piping systems, their characteristics and insulation requirements.
 - i. heating
 - ii. chilled water
 - iii. refrigeration
 - iv. glycol
3. Identify pre-formed products, their application and procedures for use.
4. Identify fastening devices and techniques.
5. Describe the procedures used to install insulation on plumbing and mechanical piping.
6. Identify types of vapour barriers and describe their characteristics and applications.
 - i. ASJ
 - ii. RFFRK
 - iii. MLV
 - iv. mastics

7. Describe the importance of vapour barriers on plumbing and mechanical piping systems.
8. Describe the procedures used to install vapour barriers on plumbing and mechanical piping systems.
9. Identify types of adhesives and their applications.

Practical Requirements:

1. Insulate pipe and various fittings using fibreglass insulation.
2. Insulate pipe and various fittings using mineral wool.

HF1190 Fire Stop System Installation I

Learning Outcomes:

- Demonstrate knowledge of fire stop systems for architectural, structural, mechanical and electrical components (introduction).
- Demonstrate knowledge of applying fire stop materials to architectural, structural, mechanical, and electrical components (introduction).

Duration: 24 Hours

Pre-Requisite(s): HF1121

Objectives and Content:

1. Describe purpose and reasons for different types of fire stop applications.
2. Identify regulations pertaining to fire stop system installation.
3. Identify types of fire stop materials used in fire stop systems.
 - i. caulking
 - ii. wrap strips
 - iii. intumescent boards and collars
 - iv. bricks
 - v. pillows
 - vi. putty
 - vii. mortar
 - viii. mineral fiber
 - ix. foams
 - x. cement
4. Describe purpose and reasons for different types of fire stop applications.
5. Calculate material requirements for fire stop systems.
6. Identify types of fire stop materials.
7. Describe fire stop installation material application techniques.
8. Identify types of cutting tools used to cut materials in fire stop installation.
 - i. saws
 - ii. snips
 - iii. knives

9. Identify types of tools used to fasten materials for fire stop system installation.
 - i. band tensioners
 - ii. powder-actuated tools
 - iii. drills
 - iv. pin welders
 - v. caulking guns
 - vi. trowels

Practical Requirements:

1. Apply firestopping materials to penetrations.
 - i. piping
 - ii. floor and ceiling

HF1430 Fireproofing Installation I

Learning Outcomes:

- Demonstrate knowledge of applying fireproofing to architectural, structural, mechanical and electrical components.

Duration: 18 Hours

Pre-Requisite(s): HF1121

Objectives and Content:

1. Identify types of materials used in fireproof systems.
2. Describe material application techniques for fireproofing installation.
3. Identify types of cutting tools used to cut materials for fireproofing installation.
 - i. saws
 - ii. snips
 - iii. knives
4. Identify types of tools used to fasten materials for fireproofing installation.
 - i. band tensioners
 - ii. powder-actuated tools
 - iii. drills
 - iv. pin welders

Practical Requirements:

None.

6. Identify and implement the health and safety regulations and responsibilities with respect to asbestos abatement.
 - i. Occupational Health and Safety (OH&S)
 - ii. WHIMIS
 - iii. jurisdictional
7. Identify and implement the health and safety regulations and responsibilities with respect to the use of PPE for asbestos abatement.
8. Identify materials used for temporary enclosures.
 - i. studs and polyethylene
 - ii. control cubes
9. Identify types of temporary enclosures.
10. Identify types of containment devices for asbestos samples.
11. Identify sampling information required to document sample.
 - i. date and time taken
 - ii. line number
 - iii. who took the sample
 - iv. location
 - v. chain of evidence
12. Identify procedures for collection of samples.
13. Identify the types of asbestos and their characteristics.
14. Describe personal health and medical issues relating to asbestos.
15. Identify materials required for abatement.
 - i. polyethylene
 - ii. studs
 - iii. tape
 - iv. adhesive
 - v. fasteners
16. Identify tools and safety equipment required for abatement.
 - i. manometer
 - ii. aviation snips
 - iii. negative air machines
 - iv. glove bags
 - v. High Efficiency Particulate Air (HEPA) vacuum
 - vi. fall protection equipment
 - vii. PPE

17. Identify and implement the health and safety regulations and responsibilities with respect to the disposal of asbestos and other products.
 - i. disposable coveralls
 - ii. filters
 - iii. gloves
 - iv. rags
18. Identify regulations pertaining to the requirements for decontamination.
19. Describe the procedures used to secure work area.
20. Identify and implement the regulations and responsibilities with respect to the removal and containment of asbestos.
21. Identify materials used to construct containment area.
22. Identify types of temporary enclosures.
23. Identify equipment used in asbestos abatement.
24. Determine required number of negative air machines and their locations.
25. Identify electrical safety risks.
26. Identify and implement regulations and responsibilities with respect to the containment of asbestos.

Practical Requirements:

None.

HF1440 Asbestos Removal

Learning Outcomes:

- Demonstrate knowledge of procedures used for removing asbestos.
- Demonstrate knowledge of regulations pertaining to the removal of asbestos.
- Demonstrate knowledge of procedures used for disposal of asbestos.
- Demonstrate knowledge of regulations pertaining to the disposal of asbestos.
- Demonstrate knowledge of procedures used for decontamination area and equipment.
- Demonstrate knowledge of regulations pertaining to the decontamination of area and equipment.

Duration: 12 Hours

Pre-Requisite(s): HF1121

Objectives and Content:

1. Describe methods used for asbestos removal.
2. Identify types of tools and equipment used for asbestos removal.
 - i. HEPA vacuum
 - ii. hoses
 - iii. wire brushes
 - iv. scrapers
 - v. knives
 - vi. snips
 - vii. airless spray machines
 - viii. shovels
 - ix. brooms
3. Describe procedures used for hot and cold removal.
4. Identify and implement the regulations and responsibilities with respect to the removal of asbestos.
5. Describe methods used for disposal of asbestos.
6. Identify precautions required for removal of asbestos.
7. Identify and implement the regulations and responsibilities with respect to the disposal of asbestos.

8. Describe procedures used to decontaminate area, equipment and personnel.
9. Describe method used to take an air sample.
10. Identify and implement the regulations and responsibilities with respect to the decontamination of area and equipment.

Practical Requirements:

None.

HF1450 Asbestos Maintenance and Repair

- Demonstrate knowledge of procedures used to encapsulate asbestos.
- Demonstrate knowledge of regulations pertaining to the encapsulation of asbestos.
- Demonstrate knowledge of procedures used to enclose asbestos.
- Demonstrate knowledge of regulations pertaining to the enclosure of asbestos.

Duration: 12 Hours

Pre-Requisite(s): HF1121

Objectives and Content:

1. Identify situations that require encapsulating asbestos.
2. Identify types of encapsulant materials.
3. Identify types of tools and equipment used to apply encapsulant materials.
4. Describe procedures used to apply encapsulant materials.
5. Identify and implement the regulations and responsibilities with respect to the encapsulation of asbestos.
6. Explain the purpose of labelling encapsulated area with asbestos warning.
7. Identify situations that require enclosing asbestos.
8. Determine method of repair based on factors.
 - i. type of asbestos
 - ii. abatement classification
 - iii. size of project
9. Identify types of materials used to build enclosure around asbestos.
10. Identify and implement the regulations and responsibilities with respect to the enclosure of asbestos.
11. Explain the purpose of labelling enclosure with asbestos warning.

Practical Requirements:

None.

HF1460 Lead Abatement and Mould Remediation

- Demonstrate knowledge of lead, its health risks and abatement procedures.
- Demonstrate knowledge of mould remediation, its health risks and procedures for remediation.

Duration: 18 Hours

Pre-Requisite(s): HF1121

Objectives and Content:

1. Identify lead and its health risks.
2. Identify health and safety exposure limits.
3. Identify jurisdictional guidelines.
4. Identify lead abatement procedures.
5. Identify mould remediation and its health risks.
6. Identify mould remediation procedures.
7. Identify environment and substrates that support mould growth.

Practical Requirements:

None.

HF1271 Blueprints I

Learning Outcomes:

- Demonstrate knowledge of the ability to read basic information from blueprints or drawings.
- Demonstrate knowledge of the interpretation of basic information from blueprints or drawings.
- Demonstrate knowledge of preparing basic drawings and diagrams.

Duration: 24 Hours

Pre-Requisite(s): HF1103, AM1201

Objectives and Content:

1. Identify and describe the components of a blueprint or drawing.
 - i. title block
 - ii. name
 - iii. address
 - iv. date
 - v. material
 - vi. system
 - vii. view
 - viii. measurements
 - ix. orientation
 - x. north
 - xi. elevation orientation

2. Identify and describe basic architectural symbols.
 - i. earth
 - ii. concrete
 - iii. block
 - iv. metal
 - v. structural steel
 - vi. wood
 - vii. gyproc over wood
 - viii. insulation
 - ix. windows
 - x. doors

3. Identify and describe different projections and drawings.
 - i. orthographic projections
 - multi-view
 - ii. pictorial drawings
 - perspective drawings
 - oblique drawings
 - isometric drawings
 - iii. general arrangements
 - iv. plot plans

4. Identify and describe different types of elevation views and details.
 - i. elevations
 - ii. sections and details

5. Describe the procedures used to determine measurements from scaled drawings.
 - i. the alphabet of lines
 - center line
 - hidden line
 - cutting plane line
 - break line
 - dimension line
 - extension line
 - object line
 - leader line
 - ii. scaling a dimension
 - scales
 - ratios
 - imperial/metric scales
 - using a scale

Practical Requirements:

1. Interpret and sketch basic drawings and diagrams.

AM1000 Introduction to Essential Skills

Learning Outcomes:

- Demonstrate knowledge of the nine nationally recognized essential skills.
- Demonstrate knowledge of the essential skills levels of complexity.
- Demonstrate knowledge of the essential skills required for the learners chosen trade.
- Demonstrate an awareness of essential skills assessments.

Duration: 9 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Identify and describe the essential skills recognized by the Government of Canada through the Office of Literacy and Essential Skills (OLES).
 - i. reading
 - ii. document use
 - iii. numeracy
 - iv. writing
 - v. oral communication
 - vi. working with others
 - vii. thinking
 - viii. computer use
 - ix. continuous learning
2. Describe the Levels of Complexity measurement assigned to essential skills.
3. Identify the essential skills, along with their complexity level, identified as necessary for the learner's trade.
 - i. RSOS / NOA content¹
 - ii. OLES Essential Skills Profiles²
 - iii. OLES tools and support for apprentices and tradespersons³
4. Describe the nature and purpose of essential skills assessment.
 - i. self-assessment & formal assessment tools
 - ii. indicators of deficiencies
 - iii. suggestions for improvement

5. Describe the benefits of essential skills improvement.
 - i. confidence at work
 - ii. employability
 - iii. success in apprenticeship
 - iv. wage & job advancement

Practical Requirements:

1. Complete an essential skills self-assessment addressing numeracy, document use and reading. The online **Government of Canada Essential Skills Indicator⁴** and **Essential Skills self-assessment for the trades⁵** are to be used unless the instructor provides a similar assessment tool or tools.
2. Participate in a group discussion about the impact of gaps in essential skills that may be revealed by the self-assessments completed, and the value of improving essential skills.

Students are graded complete or incomplete on this practical work, no grade is permitted for self-assessment performance. However, completion of the practical requirements is mandatory for completion of this unit.

Resources:

All footnotes are in the companion document “Resources for Introduction to Essential Skills” which is available online from Apprenticeship and Trade Certification.

AM1101 Math Essentials

Note: It is recommended that AM1101 be delivered in the first semester of the Pre-employment program.

Learning Outcomes:

- Demonstrate knowledge of essential numeracy skills.
- Demonstrate knowledge of mathematics as a critical element of the trade environment.
- Demonstrate knowledge of mathematical principles in trade problem solving situations.
- Demonstrate the ability to solve simple mathematical word problems.

Duration: 42 Hours

Pre-Requisite(s): None

Objectives and Content:

Wherever possible, the instructor is expected to use trade specific examples to reinforce the course objectives.

1. Describe whole number operations.
 - i. read, write, count, round off, add, subtract, multiply and divide whole numbers.
2. Describe the application of the order of operations in math problems.
3. Describe fraction and mixed number operations.
 - i. read, write, add, subtract, multiply and divide fractions.
4. Describe decimal operations.
 - i. read, write, round off, add, subtract, multiply and divide decimals.
5. Describe percent/decimal/fraction conversion and comparison.
 - i. convert between fractions, decimals and percents.
6. Identify percentage operations.
 - i. read and write percentages
 - ii. calculate base, rates and percentages

7. Identify ratio and proportion operations.
 - i. use a ratio comparing two quantities with the same units
 - ii. use a proportion comparing two ratios

8. Describe the use of the imperial measurement system in math problems.
 - i. identify units of measurement
 - length
 - mass
 - area
 - volume
 - capacity

9. Describe the use of the metric measurement system in math problems.
 - i. identify units of measurement
 - length
 - mass
 - area
 - volume
 - capacity

10. Identify angles, lines and geometric shapes.
 - i. use a protractor to measure angles
 - ii. determine whether an angle is right, acute or obtuse
 - iii. identify parallel, perpendicular, horizontal and vertical lines
 - iv. identify types of triangles, quadrilaterals, and 3-dimensional shapes

11. Describe estimation strategies.
 - i. estimate a linear measure using a referent
 - ii. estimate length, area and volume of objects in metric and imperial systems

12. Describe problem solving that involves linear measurement using instruments such as rulers or tape measures, in the metric and imperial systems.

Practical Requirements:

To emphasize or further develop specific knowledge objectives, students will be required to complete practical demonstrations which confirm proper application of mathematical theory to job skills.

AM1201 Insulator Math Fundamentals

Learning Outcomes:

- Demonstrate knowledge of mathematical concepts in the performance of trade practices.
- Demonstrate knowledge of mathematics as a critical element of the trade environment.
- Solve mathematical word problems.
- Demonstrate knowledge of mathematical principles for the purposes of problem solving, job and materials estimation, measurement, calculation, system conversion, diagram interpretation and scale conversions, formulae calculations, and geometric applications.

Duration: 42 Hours

Pre-Requisite(s): AM1101

Objectives and Content:

The instructor is required to use trade specific examples to reinforce the course objectives.

1. Describe percent/decimal/fraction conversions and comparisons in trade specific situations.
2. Describe ratios and proportions as they relate to trade specific problems.
3. Describe the use of the Imperial and Metric measurement systems in trade specific applications.
4. Describe Imperial and Metric conversions in trade specific situations.
 - i. convert between imperial and metric measurements
 - ii. convert to another unit within the same measurement system
5. Describe how to manipulate formulas using cross multiplication, dividing throughout, elimination, and substitution to solve trade specific problems.
 - i. right angle triangles
 - ii. area
 - iii. volume
 - iv. perimeter
 - v. density

6. Identify calculations involving geometry that are relevant to the trade.
 - i. angle calculations
 - ii. circle calculations

7. Identify math processes used to complete administrative trade tasks.
 - i. material estimation
 - ii. material costing
 - iii. time & labour estimates
 - iv. taxes & surcharges
 - v. markup & projecting revenue

Practical Requirements:

1. To emphasize or further develop specific knowledge objectives, students will be asked to complete practical demonstrations which confirm proper application of mathematical theory to job skills.

2. This course is **non-transferable** to other trades programs, and **not eligible for prior learning assessment**. Students completing training in this trade program are required to complete this math course. Apprentice transfers under Provincial / Territorial Mobility agreements may be exempt from this requirement.

CM2161 Communication Essentials

Learning Outcomes:

- Demonstrate knowledge of the importance of well-developed writing and oral communication skills in the workplace.
- Demonstrate knowledge of the principles of effective workplace writing.
- Demonstrate knowledge of the purpose of various types of workplace documentation and workplace meetings.
- Demonstrate knowledge of the importance of effective interpersonal skills in the workplace.
- Demonstrate knowledge of effective job search techniques

Duration: 36 Hours

Pre-Requisite(s): None

Objectives and Content:

Wherever possible, the instructor is expected to use trade specific examples to reinforce the course objectives.

1. Define communications terminology used in the trade.
2. Identify the principles of effective workplace writing.
 - i. grammar, punctuation, mechanics
 - ii. sentence and paragraph construction
 - iii. tone, language, and word choice
 - iv. the writing process
 - planning
 - writing
 - editing/revising
3. Identify sources of information used to communicate in the workplace.
 - i. regulations
 - ii. codes
 - iii. OH&S requirements
 - iv. prints, drawings and specifications
 - v. company and client documentation
4. Identify types and purposes of informal workplace documents.
 - i. reports
 - incident
 - process

- progress
 - ii. common trade specific forms
 - iii. primary and secondary methods of information gathering
 - iv. accuracy and completeness in reports and forms
- 5. Demonstrate an understanding of interpersonal communications in the workplace.
 - i. recognize group dynamics
 - ii. contribute information and expertise
 - iii. individual learning styles
 - Audible
 - Visual
 - Experiential
 - Theoretical
 - iv. recognize respectful and open communication
 - v. accept and provide feedback
 - vi. interpret non-verbal communication cues
 - body language
 - signals
- 6. Demonstrate an understanding of effective oral communication skills.
 - i. listening
 - receiving, understanding, remembering, reflecting, evaluating, paraphrasing, and responding
 - ii. speaking
 - using clear and proper words
 - tone, style, and vocabulary
 - brevity
 - iii. common workplace oral communication situations
 - introducing self and others
 - telephone conversations
 - tool box/safety talks
 - face-to-face conversations
 - communicating with co-workers, supervisors, clients, and other trades people
- 7. Identify common practices related to workplace meetings.
 - i. meeting formats
 - ii. meeting preparation
 - iii. agendas and minutes
 - iv. roles, responsibilities, and etiquette of meeting participants
- 8. Identify acceptable workplace use of communication technologies
 - i. cell / smart phone etiquette
 - ii. voice mail
 - iii. e-mail

- iv. texting / messaging through social media
 - v. teleconferencing / videoconferencing for meetings and interviews
 - vi. social networking
 - vii. other emerging technologies
9. Demonstrate an understanding of effective job search techniques
- i. employment trends, opportunities, and sources of employment
 - ii. job ads and the importance of fitting qualifications to job requirements
 - iii. resumes
 - characteristics of effective resumes
 - types of resumes
 - principles of resume formatting
 - iv. effective cover letters
 - v. job interview process
 - pre-interview preparation
 - interview conduct
 - post-interview follow up

Practical Requirements:

1. Write a well-developed, coherent, unified paragraph.
2. Complete a trade-related form.
3. Prepare an agenda for a toolbox safety talk.
4. Participate in a simulated oral workplace communication situation.
5. Prepare a resume.

SD1761 Workplace Essentials

Note: It is recommended that SD1761 be delivered in the second half of Pre-employment training.

Learning Outcomes:

- Demonstrate a knowledge of workplace requirements in the areas of personal responsibility, unions, workers compensation, workers' rights, and human rights.
- Demonstrate a knowledge of quality customer service.

Duration: 24 Hours

Pre-Requisite(s): None

Objectives and Content:

Wherever possible, the instructor is expected to use trade specific examples to reinforce the course objectives.

1. Identify personal responsibilities and attitudes that contribute to on-the-job success.
 - i. asking questions
 - ii. working safely
 - iii. accepting constructive feedback
 - iv. time management & punctuality
 - v. respect for authority
 - vi. stewardship of materials, tools and properties
2. Define unions and identify their role in the workplace.
 - i. purpose of unions
 - ii. common union structure
 - iii. unions in this trade
3. Demonstrate an understanding of the Worker's Compensation process.
 - i. aims, objectives, and benefits of the Workplace Health, Safety and Compensation Commission
 - ii. role of the workers advisor
 - iii. internal review process

4. Demonstrate an understanding of worker's rights.
 - i. labour standards
 - ii. regulations, including:
 - hours of work & overtime
 - termination of employment
 - minimum wages & allowable deductions
 - statutory holidays, vacation time, and vacation pay

5. Demonstrate an understanding of human rights issues.
 - i. awareness of the Human Rights Code and the role of the Human Rights Commission
 - ii. categories of discrimination and strategies for prevention
 - direct
 - systemic
 - adverse effect
 - iii. types of discrimination
 - race
 - ethnic origin
 - colour
 - religion
 - age
 - gender identify
 - sexual orientation
 - marital status
 - family status
 - disability
 - criminal conviction that has been pardoned
 - iv. conduct that constitutes harassment and discrimination
 - objectionable conduct
 - comments or displays made either on a one-time or continuous basis that demeans, belittles, or causes personal humiliation or embarrassment to the recipient
 - v. the value of diversity in the workplace
 - culture
 - gender identify
 - sexual orientation

6. Demonstrate an understanding of quality customer service.
 - i. importance of quality service
 - ii. barriers to quality service
 - physical and physiological
 - cultural
 - technological
 - iii. customer needs & common methods for meeting them
 - iv. characteristics & importance of a positive attitude
 - v. interactions with challenging customers
 - vi. addressing complaints and resolve conflict

Practical Requirements:

None.

MC1062 Computer Essentials

Learning Outcomes:

- Demonstrate knowledge of desktop/laptop and mobile computers and their operation.
- Demonstrate knowledge of word processing and spreadsheet software, internet browsers and their applications.
- Demonstrate knowledge of e-mail applications and procedures.
- Demonstrate an awareness of security issues related to computers.
- Demonstrate an awareness of online learning using computers.

Duration: 15 Hours

Pre-Requisite(s): None

Objectives and Content:

When possible, the instructor is expected to use trade specific examples to reinforce the course objectives.

1. Identify computer types used in the workplace, and the characteristics of each.
 - i. desktop/laptop computers
 - ii. tablets
 - iii. smartphones
2. Identify common desktop and mobile operating systems.
 - i. Windows
 - ii. Mac OS
 - iii. iOS
 - iv. Android
3. Describe the use of Windows operating system software.
 - i. start and end a program
 - ii. use the help function
 - iii. use the find function
 - iv. maximize and minimize a window
 - v. open and scroll through multiple windows
 - vi. use the task bar
 - vii. adjust desktop settings such as screen savers, screen resolution, and backgrounds
 - viii. shut down a computer

4. Identify the skills necessary to perform file management commands.
 - i. create folders
 - ii. copy files and folders
 - iii. move files and folders
 - iv. rename files and folders
 - v. delete files and folders

5. Describe the use of word processing software to create documents.
 - i. enter & edit text
 - ii. indent and tab text
 - iii. change text attributes
 - bold
 - underline
 - font
 - iv. change layout format
 - margins
 - alignment
 - line spacing
 - v. spell check and proofread
 - vi. save, close & reopen a document
 - vii. print document

6. Describe the use of spreadsheet software to create documents.
 - i. enter data in cells
 - ii. format data in cells
 - iii. create formulas to add, subtract, multiply and divide
 - iv. save, close & reopen a spreadsheet
 - v. print spreadsheet

7. Describe the use of the internet in the workplace.
 - i. web browsers
 - ii. search engines
 - iii. security issues
 - iv. personal responsibility for internet use at work

8. Describe the role of e-mail.
 - i. e-mail etiquette
 - grammar and punctuation
 - privacy issues when sharing and forwarding e-mail
 - work appropriate content
 - awareness of employer policies
 - ii. managing e-mail
 - using folders
 - deleting, forwarding, replying

- iii. adding attachments to e-mail
 - iv. view e-mail attachments
 - v. printing e-mail
9. Describe computer use for online learning.
- i. online training
 - ii. level exams
 - iii. study guides
 - iv. practice exams

Practical Requirements:

1. Create, save and print a document using word processing software.
2. Create, save and print a document using spreadsheet software.
3. Send and receive an e-mail with an attachment.

AP1102 Introduction to Apprenticeship

Learning Outcomes:

- Demonstrate knowledge of how to become a registered apprentice.
- Demonstrate knowledge of the steps to complete an apprenticeship program.
- Demonstrate knowledge of various stakeholders in the apprenticeship process.
- Demonstrate knowledge of the Red Seal Program.

Duration: 12 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Define terminology associated with apprenticeship.
 - i. apprentice
 - ii. registered apprentice
 - iii. trade qualifier
 - iv. journeyperson
 - v. certified journeyperson
 - vi. Certificate of Apprenticeship
 - vii. Certificate of Qualification
 - viii. dual certification
 - ix. compulsory trades
2. Explain the roles and responsibilities of those involved in the apprenticeship system in Newfoundland and Labrador.
 - i. registered apprentice
 - ii. training institution
 - iii. employer
 - iv. journeyperson
 - v. mentor
 - vi. Department of Immigration, Skills and Labour
 - Industrial Training section
 - Standards and Curriculum section
 - vii. Provincial Trade Advisory Committees (PTAC)
 - viii. Provincial Apprenticeship and Certification Board (PACB)
3. Describe the training components of an apprenticeship.
 - i. in-school
 - Pre-employment / Level 1
 - advanced levels

- ii. workplace experience
- 4. Explain the steps in the registered apprenticeship process.
 - i. meet entrance requirements
 - education
 - employment
 - Recognition of Prior Learning (RPL) - if applicable
 - ii. complete the registration process
 - application
 - required documents
 - iii. complete the Memorandum of Understanding (MOU)
 - contract responsibilities
 - probation period
 - cancellation
 - iv. maintain Record of Occupational Progress (Logbook)
 - sign off skills
 - record hours
 - update Apprenticeship Program Officer (APO) on progress
 - v. class calls
 - hour requirements
 - EI eligibility
 - training schedule
 - vi. level examinations - if applicable
 - vii. progression schedule
 - apprenticeship level
 - wage rates
 - viii. certification examinations
 - Provincial
 - Interprovincial
 - written
 - practical - if applicable
 - ix. certification
 - Certificate of Apprenticeship
 - Certificate of Qualification
 - Provincial journeyperson - Blue Seal
 - Interprovincial journeyperson - Red Seal endorsement (RSE)
- 5. Identify the Conditions Governing Apprenticeship.
- 6. Discuss cancellation of apprenticeship.
 - i. failure to notify of address change
 - ii. extended periods of unemployment
 - iii. lack of contact with an APO for an extended period
 - iv. failure to respond to class calls
 - v. declining of multiple class calls

7. Explain the Interprovincial Standards Red Seal program.
 - i. designated Red Seal trades
 - ii. the Red Seal Occupational Standard (RSOS)
 - iii. relationship of RSOS to IP examination
 - iv. national qualification recognition and mobility
8. Identify the current financial incentives available to apprentices.
 - i. Federal
 - ii. Provincial
9. Explain the Provincial / Territorial Apprentice Mobility Guidelines.
 - i. temporary mobility
 - ii. permanent mobility
10. Describe Atlantic and National Harmonization initiatives.

Practical Requirements:

1. Use the Provincial Apprenticeship and Trades Certification website at www.gov.nl.ca/atcd.
 - i. locate, download, and complete the Application for Apprenticeship and Memorandum of Understanding (MOU)
 - ii. locate the address of the Industrial Training office closest to this campus
 - iii. locate the training schedule and identify the start date of the next class call for this trade
 - iv. locate and review the learning resources applicable to this trade
 - Study Guide
 - Exam Preparation Guide
 - Plan of Training
2. Use the Plan of Training applicable to this trade.
 - i. locate the hours for the trade
 - total in-school
 - total required for certification
 - ii. locate the number of levels
 - iii. locate the courses in each level
 - iv. locate the hours required for progression to a Level II apprentice and the wage percentage of that level

Level 2

HF2010 Tank, Vessel and Equipment Insulation I

Learning Outcomes:

- Demonstrate knowledge of insulating tanks, vessels and equipment.
- Demonstrate knowledge of procedures used to install insulation on tanks, vessels and equipment.
- Demonstrate knowledge of vapour barriers, their application and the procedures used for installation.
- Demonstrate knowledge of specifications, types of drawings and drawing components.

Duration: 24 Hours

Pre-Requisite(s): Pre-employment

Objectives and Content:

1. Identify types of insulation.
 - i. fiberglass
 - ii. cellular glass
 - iii. mineral fibre
 - iv. calcium silicate
 - v. urethane
 - vi. nano-like technology

2. Identify types of tanks, vessels and equipment that require insulation.
 - i. tanks
 - crude oil
 - liquefied natural gas
 - asphalt tanks
 - ii. vessels
 - desalters
 - aerators
 - crackers
 - exchangers
 - iii. equipment
 - boilers
 - pumps
 - turbines

3. Identify hazards associated with various types of insulation.

4. Apply basic geometry related to insulating tanks, vessels and equipment.
5. Explain tank, vessel and equipment expansion and contraction.
6. Describe procedures used to install insulation on tanks, vessels and equipment.
7. Identify specifications related to installing insulation on tanks, vessels and equipment.
 - i. location of pins and studs
 - ii. types and spacing of banding
 - iii. expansion springs
8. Identify types of vapour barriers and their applications.
 - i. mastics
 - ii. all service jacket (ASJ)
 - iii. foil scrim kraft (FSK)
 - iv. reinforced foil flame retardant kraft (RFFRK)
 - v. blue skin
 - vi. pitt wrap
9. Identify types of adhesives and their applications.
10. Describe vapour barrier installation techniques.
11. Apply basic geometry related to the installation of vapour barriers on tanks, vessels and equipment.
12. Identify specifications and types of drawings, their application and procedures for use.
 - i. type of insulation
 - ii. thickness
 - iii. jacketing
 - iv. fasteners
 - v. vapour barrier
 - vi. omissions
 - vii. band spacing
 - viii. types of coating
 - ix. types of sealants
 - x. scope of work

Practical Requirements:

None.

HF2020 Plumbing and Mechanical Piping System Insulation II

Learning Outcomes:

- Demonstrate knowledge of cladding, jacketing and finishes, their purposes and applications.
- Demonstrate knowledge of procedures used to install cladding, jacketing and finishes on insulated plumbing and finishes on insulated plumbing and mechanical piping systems.
- Demonstrate knowledge of substrates and the procedures used to prepare them for installation of insulation.

Duration: 24 Hours

Pre-Requisite(s): Pre-employment

Objectives and Content:

1. Identify types of cladding, jacketing and finishes, and describe their characteristics and applications.
 - i. ASJ
 - ii. stainless steel
 - iii. aluminum
 - iv. PVC
 - v. Canvas
 - vi. Lagging
 - vii. foil scrim kraft (foil skin)
 - viii. cements
2. Identify fasteners and describe their characteristics and applications.
 - i. lagging
 - ii. screws
 - iii. banding
 - iv. PVC welding adhesives
 - v. tacks
 - vi. tape
 - vii. rivets
3. Identify plumbing systems and describe their characteristics.
 - i. hot
 - ii. cold
 - iii. recirculation water
 - iv. rainwater leaders
 - v. vent piping
 - vi. sanitary drains

4. Identify mechanical piping systems and describe their characteristics.
 - i. heating
 - ii. chilled water
 - iii. refrigeration

5. Describe procedures used to install cladding, jacketing and finishes on insulated plumbing and mechanical piping systems.
 - i. watershed
 - ii. lap placement
 - iii. fastening

6. Identify symbols and abbreviations found on types of drawings.
 - i. valves
 - ii. fittings
 - iii. tees
 - iv. welds
 - v. flanges
 - vi. unions
 - vii. elbows
 - viii. equipment
 - ix. temperature range
 - x. heat trace
 - xi. change in direction

Practical Requirements:

1. Apply insulation to plumbing and piping fixtures with proper vapour barriers and complete with cladding.

HF2030 Mechanical Ducting Insulation I

Learning Outcomes:

- Demonstrate knowledge of installing insulation on mechanical ducting systems.
- Demonstrate knowledge of the procedures used to install insulation on mechanical ducting systems.
- Demonstrate knowledge of the application of vapour barrier on insulated mechanical ducting.

Duration: 24 Hours

Pre-Requisite(s): Pre-employment

Objectives and Content:

1. Identify types of insulation, their characteristics and applications.
 - i. fibreglass (rigid board, flexible blankets/batts)
 - ii. elastomeric foam
2. Identify mechanical ducting systems, their characteristics and insulation requirements.
 - i. conditioned air
 - ii. outside air
 - iii. heat
 - iv. exhaust
3. Identify fastening devices and techniques.
4. Describe the procedures used to install insulation on mechanical ducting systems.
5. Identify types of vapour barriers and describe their characteristics and applications.
 - i. ASJ
 - ii. RFFRK
 - iii. tar paper
 - iv. mastics
 - v. weatherproof membranes
6. Describe the importance of vapour barriers on mechanical ducting.
7. Identify fastening devices and techniques.

8. Describe procedures used to apply vapour barriers on insulated mechanical ducting.
9. Identify vapour barrier requirements.

Practical Requirements:

1. Apply insulation to ducting then seal with vapour barrier and necessary cladding.

HF2040 Mechanical Equipment Insulation I

Learning Outcomes:

- Demonstrate knowledge of installing insulation on mechanical equipment.
- Demonstrate knowledge of procedures used to install insulation on mechanical equipment.
- Demonstrate knowledge of the application of vapour barrier on insulated mechanical equipment.
- Demonstrate knowledge of substrates and the procedures used to prepare them for installation of insulation.

Duration: 24 Hours

Pre-Requisite(s): Pre-employment

Objectives and Content:

1. Identify types of insulation, their characteristics and applications.
 - i. fibreglass (rigid board, flexible blankets/batts)
 - ii. elastomeric foam
 - iii. cellular glass (foam glass)
2. Identify types of mechanical equipment, their characteristics and insulation requirements.
 - i. pumps
 - ii. fans
 - iii. tanks
 - iv. boilers
 - v. chillers
 - vi. condensers
 - vii. heat exchangers
3. Identify fastening devices and techniques.
4. Describe the procedures used to install insulation on mechanical equipment.
5. Identify types of vapour barriers and describe their importance, characteristics and applications.
 - i. ASJ
 - ii. RFFRK
 - iii. tar paper
 - iv. mastics
 - v. films

- vi. weatherproof membranes
- 6. Identify fastening devices and techniques.
- 7. Describe procedures used to apply vapour barriers on insulated mechanical equipment.
- 8. Identify vapour barrier requirements.
- 9. Identify types of drawings, their application and procedures for use.
 - i. civil
 - ii. architectural
 - iii. structural
 - iv. mechanical
 - v. electrical
 - vi. process
 - vii. isometric
- 10. Identify drawing components.
 - i. scales
 - ii. details
 - iii. legends
 - iv. elevations
 - v. notes

Practical Requirements:

- 1. Apply insulation and finishes to vessels and seal for complete vapour barrier.

HF2050 Soundproofing Insulation

Learning Outcomes:

- Demonstrate knowledge of insulating piping for soundproofing and their installation procedures.
- Demonstrate knowledge of insulating turbines, equipment and mechanical systems for soundproofing and their installation procedures.
- Demonstrate knowledge of acoustic panels, their applications and the procedures used to fabricate them.
- Demonstrate knowledge of acoustic panels, their applications and installation procedures.

Duration: 24 Hours

Pre-Requisite(s): Pre-employment

Objectives and Content:

1. Identify reasons for soundproofing piping.
2. Identify types of piping requiring soundproofing.
3. Identify types of sound deadening materials, their characteristics and applications.
 - i. lead sheeting
 - ii. MLV (barium-impregnated material)
 - iii. rigid board
 - iv. flexible acoustic liners
4. Identify types of fasteners, their characteristics and applications.
 - i. self-seal laps
 - ii. tape
 - iii. wire
 - iv. banding
 - v. staples
5. Describe the procedures used to apply finish material.
 - i. aluminum
 - ii. stainless steel
 - iii. PVC
6. Identify reasons for soundproofing turbines, equipment and mechanical systems.

7. Describe measuring techniques for installing soundproofing.
8. Describe methods used to secure insulation.
 - i. pin welding
 - ii. banding
 - iii. wiring
 - iv. using hexagonal wire mesh
9. Identify types of sound deadening materials, their characteristics and applications.
 - i. lead sheeting
 - ii. MLV (barium-impregnated material)
 - iii. rigid board
 - iv. flexible acoustic liners
10. Identify types of finishes, their characteristics and applications.
 - i. aluminum
 - ii. cement
 - iii. fibreglass cloth with adhesive
 - iv. mastic
11. Describe the procedures used to install soundproofing on turbines, equipment and mechanical systems.
12. Describe the properties of acoustic materials.
 - i. mineral wool
 - ii. mineral fiber
 - iii. acoustic duct liner
 - iv. urethane
13. Describe the materials and procedures used to fabricate acoustic panels.
 - i. vinyls
 - ii. fabrics
 - iii. adhesives
 - iv. perforated metals
14. Identify types of fasteners, their characteristics and applications.
 - i. pins
 - ii. adhesives
 - iii. perforated hangers
15. Describe the procedures used to install acoustic panels.

Practical Requirements:

None.

HF2060 Underground Insulating System Installation

Learning Outcomes:

- Demonstrate knowledge of insulating piping in underground systems and the installation procedures.
- Demonstrate knowledge of pour-in-place insulation for underground systems and the procedures used for its installation.

Duration: 24 Hours

Pre-Requisite(s): Pre-employment

Objectives and Content:

1. Identify types of pipe insulation, their characteristics and applications.
 - i. cellular glass
 - ii. urethane
 - iii. nano-like materials
2. Identify types of protective membranes for underground systems.
 - i. asphalt-based membrane
 - ii. fibreglass cloth
 - iii. resin
 - iv. mastic
3. Explain expansion and contraction of pipe.
4. Identify hazards and describe procedures for working in confined spaces.
5. Identify types of pour-in-place insulation.
 - i. diatomaceous earth
 - ii. polystyrene beads
 - iii. perlite
 - iv. hydrophobic pourable insulation
6. Describe trenching and formwork requirements related to installing pour-in-place insulation to underground systems.
7. Identify hazards associated with working in trenches.
 - i. cave-ins
 - ii. gases
 - iii. limited access/egress
 - iv. grading

8. Identify application methods for insulation (pour-in-place or spray-on).

Practical Requirements:

1. Apply insulation to piping and complete impermeable seal for underground piping application.

HF2070 Sealers, Coatings and Spray-On Insulation

Learning Outcomes:

- Demonstrate knowledge of protecting work area for spraying sealers, coatings and spray-on insulation.
- Demonstrate knowledge of preparing material, equipment and substrate for spraying.
- Demonstrate knowledge of installing reinforcing materials for spraying.
- Demonstrate knowledge of applying spray-on insulation, coatings and sealers.

Duration: 24 Hours

Pre-Requisite(s): Pre-employment

Objectives and Content:

1. Identify types of protective sheeting used to protect surfaces.
 - i. drop cloths
 - ii. polyethylene
2. Identify types of tapes and adhesives.
 - i. duct tape
 - ii. tuck tape
 - iii. masking tape
 - iv. spray glue contact adhesive
 - v. brush-on adhesive
3. Identify types of spray equipment.
 - i. airless
 - ii. two-part guns
 - iii. hoppers
 - iv. spray dispenser
4. Describe procedures used to assemble/disassemble spray equipment.
5. Identify factors to consider when inspecting substrate.
 - i. temperature
 - ii. deficiencies
 - iii. cleanliness

6. Identify types of cleaners used to clean substrate.
 - i. soap and water
 - ii. tri-sodium phosphate (TSP)
 - iii. methyl ethyl ketone (MEK)
 - iv. methyl hydrate

7. Identify types of materials used to spray.
 - i. polyurethane
 - ii. cellulose fibre
 - iii. sealants
 - iv. coatings
 - v. mastics

8. Describe procedures used to perform a layout.

9. Explain calculation used to develop a layout.

10. Describe fastening techniques used to secure anchors.
 - i. pin welding
 - ii. bonding
 - iii. self-adhering

11. Describe procedures used to attach reinforcing materials to anchors.
 - i. glass fabric
 - ii. poultry wire
 - iii. expanded metal lath

12. Identify types of spray equipment and their procedures for use.
 - i. airless
 - ii. two-part guns
 - iii. hoppers
 - iv. spray dispenser

13. Describe material application techniques.

Practical Requirements:

None.

HF2080 Insulating Systems for Refractory Application

Learning Outcomes:

- Demonstrate knowledge of insulating refractory systems.
- Demonstrate knowledge of procedures used to install insulation on refractory systems.
- Demonstrate knowledge of reflective systems, their applications and the procedures used to install them.
- Demonstrate knowledge of procedures used to install cladding, protective jacketing and finishes to refractory systems.
- Demonstrate knowledge of substrates and the procedures used to prepare them for installation of insulation.

Duration: 18 Hours

Pre-Requisite(s): Pre-employment

Objectives and Content:

1. Identify types of refractory insulation.
 - i. castable
 - ii. mortars
 - iii. high-temperature cements
 - iv. calcium silicate
 - v. ceramic fibre
2. Explain temperature range of refractory application.
3. Explain expansion and contraction of joints pertaining to refractory systems.
4. Describe procedures used to install insulation on refractory systems.
 - i. troweling
 - ii. pouring
 - iii. spraying
 - iv. multi-layer application
5. Explain the procedures for elimination of thermal shock.
6. Identify types of reflective material, their characteristics and applications.
 - i. impregnated high-temperature reflective fabrics
 - ii. stainless steel

7. Describe the procedures used to install reflective material using fasteners.
 - i. latches
 - ii. wire
 - iii. screws
 - iv. rivets
 - v. banding
 - vi. pins
 - vii. j-hooks

8. Identify types of cladding, protective jacketing and finishes.
 - i. aluminum
 - ii. stainless steel
 - iii. high-temperature (HT) cement
 - iv. fiberglass cloth

9. Describe procedures used to install cladding, protective jacketing and finishes to refractory systems.

10. Interpret and apply findings from specifications and types of drawings.

Practical Requirements:

None.

HF2090 Insulating Systems for Cryogenic Application

Learning Outcomes:

- Demonstrate knowledge of cryogenic insulation systems and their applications.
- Demonstrate knowledge of the procedures used to apply insulation to cryogenic systems.
- Demonstrate knowledge of the application of vapour barrier on insulated components of cryogenic systems
- Demonstrate knowledge of the procedures used to apply vapour barrier on insulated components of cryogenic systems.
- Demonstrate knowledge of the procedures used to install cladding, protective jacketing and finishes to cryogenic systems.
- Demonstrate knowledge of specification, types of drawings and drawing components.

Duration: 24 Hours

Pre-Requisite(s): Pre-employment

Objectives and Content:

1. Identify types of insulation and their applications.
 - i. cellular glass
 - ii. polyurethane
 - iii. nano-like technology
 - iv. perlite
 - v. oil-free mineral wool
2. Describe the temperature range of cryogenic applications.
3. Describe the importance of accurate measurements in cryogenic applications.
4. Describe procedures used to install insulation on cryogenic systems.
 - i. pouring
 - ii. spraying
 - iii. wrapping
 - iv. multi-layer application

5. Identify types of vapour barrier material and describe their importance, characteristics and applications.
 - i. films
 - ii. laminates
 - iii. metals
 - iv. mastics
 - v. sealants
6. Describe the importance of accurate measurements in cryogenic applications.
7. Identify vapour barrier requirements.
8. Describe methods used to apply vapour barrier material on insulated components of cryogenic systems.
 - i. applying mastics
 - ii. applying adhesives
 - iii. applying tapes
9. Identify types of cladding, protective jacketing and finishes.
 - i. aluminum
 - ii. stainless steel
 - iii. PVC
 - iv. Mastic
10. Describe procedures used to install cladding, protective jacketing and finishes to cryogenic systems.
11. Identify types of fasteners used to install cladding, protective jacketing and finishes to cryogenic systems.
 - i. banding
 - ii. adhesives
 - iii. latches
12. Identify specifications on drawings in relation to their application and procedures for use.
 - i. type of insulation
 - ii. thickness
 - iii. jacketing
 - iv. fasteners
 - v. vapour barrier
 - vi. omissions
 - vii. band spacing
 - viii. types of coating
 - ix. types of sealants
 - x. scope of work

Practical Requirements:

1. Apply foam glass insulation to piping, valves, and fittings.

Level 3

HF3020 Piping and Fitting Insulation II

Learning Outcomes:

- Demonstrate knowledge of cladding, jacketing and finishes, their purpose and application.
- Demonstrate knowledge of procedures used to install cladding, jacketing and finishes on insulated piping and fittings.

Duration: 24 Hours

Pre-Requisite(s): Level 2

Objectives and Content:

1. Identify types of cladding, jacketing and finishes, and describe their characteristics and applications.
 - i. stainless steel
 - ii. aluminum
 - iii. polyvinyl chloride (PVC)
 - iv. cements
 - v. galvanized steel
 - vi. mastic
 - vii. reinforced asphalt-based membrane
 - viii. mass-loaded vinyl (MLV) (barium-impregnated material)
 - ix. self-adhering jacketing tape
 - x. weatherproof membranes

2. Identify fasteners and their characteristics and applications.
 - i. screws
 - ii. banding
 - iii. PVC glue
 - iv. tacks
 - v. tape
 - vi. rivets

3. Describe procedures used to install cladding, jacketing and finishes on insulated piping and fittings.
 - i. tees
 - ii. transitions
 - iii. elbows
 - iv. end caps

Practical Requirements:

None.

HF3030 Tank, Vessel and Equipment Insulation II

Learning Outcomes:

- Demonstrate knowledge of cladding, jacketing and finishes, their purpose and application.
- Demonstrate knowledge of procedures to install components on tanks, vessels and equipment.

Duration: 30 Hours

Pre-Requisite(s): Level 2

Objectives and Content:

1. Identify types of cladding, jacketing and finishes, and describe their properties and applications.
 - i. stainless steel
 - ii. aluminum
 - iii. PVC
 - iv. cements
 - v. weatherproof membranes

2. Identify fasteners and their characteristics and applications.
 - i. screws
 - ii. banding
 - iii. PVC glue
 - iv. tacks
 - v. tape
 - vi. rivets
 - vii. temporary holding devices
 - viii. expansion springs
 - ix. S-clips
 - x. belt loops

3. Describe procedures to install components on tanks, vessels and equipment.
 - i. head segments
 - ii. rings
 - iii. transitions
 - iv. end caps
 - v. laterals
 - vi. flashing
 - vii. inspection port

Practical Requirements:

1. Insulate tank, apply gore heads and seal all joints.

HF3040 Mechanical Ducting Insulation II

Learning Outcomes:

- Demonstrate knowledge of cladding, jacketing and finishes, their characteristics and applications.
- Demonstrate knowledge of procedures used to install cladding, jacketing and finishes on insulated mechanical ducting systems.

Duration: 24 Hours

Pre-Requisite(s): Level 2

Objectives and Content:

1. Identify types of cladding, jacketing and finishes, and describe their characteristics and applications.
 - i. stainless steel
 - ii. aluminum
 - iii. PVC
 - iv. canvas
 - v. mastic
 - vi. weatherproof membranes
2. Identify fasteners and describe their characteristics and applications.
 - i. lagging
 - ii. screws
 - iii. banding
 - iv. PVC welding adhesive
 - v. tacks
 - vi. tape
 - vii. rivets
3. Identify mechanical ducting systems and describe their characteristics.
 - i. conditioned air
 - ii. outside air
 - iii. heat
 - iv. exhaust
4. Describe procedures used to install cladding, jacketing and finishes on insulated mechanical ducting systems.
 - i. watershed
 - ii. lap placement
 - iii. fastening
 - iv. sealants

Practical Requirements:

1. Insulate duct, seal all joints for complete vapour barrier and install cladding for water shed.

HF3050 Mechanical Equipment Insulation II

Learning Outcomes:

- Demonstrate knowledge of cladding, jacketing and finishes, their characteristics and applications.
- Demonstrate knowledge of procedures used to install cladding, jacketing and finishes on insulated mechanical equipment.

Duration: 24 Hours

Pre-Requisite(s): Level 2

Objectives and Content:

1. Identify types of cladding, jacketing and finishes, and describe their characteristics and applications.
 - i. stainless steel
 - ii. aluminum
 - iii. PVC
 - iv. canvas
 - v. mastic
 - vi. weatherproof membranes
2. Identify fasteners and describe their characteristics and applications.
 - i. lagging
 - ii. screws
 - iii. banding
 - iv. PVC welding adhesive
 - v. tacks
 - vi. tape
 - vii. rivets
3. Describe procedures used to install cladding, jacketing and finishes on insulated mechanical equipment.
 - i. watershed
 - ii. lap placement
 - iii. fastening
 - iv. sealants

Practical Requirements:

1. Insulate piping with complete vapour barrier and finish with cladding.

HF3060 Removable Cover Installation (Soft Cover)

Learning Outcomes:

- Demonstrate knowledge of removable covers, their applications and the procedures used to fabricate them.
- Demonstrate knowledge of removable covers, their applications and the procedures used to fasten them.

Duration: 24 Hours

Pre-Requisite(s): Level 2

Objectives and Content:

1. Identify types of layout tools used to lay out removable covers.
 - i. dividers
 - ii. levels
 - iii. tape measures
 - iv. trammel points
 - v. squares
2. Identify types of tools used to fabricate soft covers.
 - i. C-ring pliers
 - ii. stitch staplers
 - iii. sewing machines
 - iv. shears
3. Perform measurements and calculations for materials used to create drawings and fabricate removable covers.
4. Identify types of fastening devices used for soft covers.
 - i. lacing anchors
 - ii. D-rings
 - iii. hook and loop
 - iv. draw strings or wire
5. Describe the procedures used to install fastening devices.
6. Describe procedures used to fit covers to equipment and fittings.

7. Identify types of fastening devices used to secure covers.
 - i. lacing anchors
 - ii. hook and loop
 - iii. draw strings or wire
8. Describe the procedures used to install fastening devices.

Practical Requirements:

1. Measure piping fittings for soft cover application.

HF3070 Marine Applications

Learning Outcomes:

- Demonstrate knowledge of insulating bulkheads, deckheads and hulls.
- Demonstrate knowledge of the procedures used to install cladding, protective jacketing and finishes on marine applications.
- Demonstrate knowledge of materials used for marine applications.

Duration: 24 Hours

Pre-Requisite(s): Level 2

Objectives and Content:

1. Identify types of cutting tools and procedures used to cut insulation.
 - i. hand saws
 - ii. knives
2. Define terminology related to marine applications.
3. Identify specifications related to marine applications.
 - i. coast guard
 - ii. project
 - iii. manufacturers
 - iv. ULC
4. Describe procedures used to fasten insulation.
5. Describe procedures used to fasten wire mesh.
6. Identify fire-rated systems used to fireproof bulkheads, deckheads and hulls.
 - i. A60
 - ii. A90
 - iii. H120
7. Identify types of cladding, protective jacketing and finishes on marine applications.
 - i. stainless steel
 - ii. aluminum
 - iii. fiberglass

8. Describe procedures used to install cladding, protective jacketing and finishes on marine applications.
9. Identify types of fasteners used to install cladding, protective jacketing and finishes on marine applications.
 - i. dome caps
 - ii. washers
 - iii. clips
 - iv. rivets
 - v. screws
10. Identify safety hazards associated with marine applications.
11. Identify various insulating materials used in marine applications.
 - i. mineral fibre
 - ii. fiberglass
 - iii. fabric-faced insulation
 - iv. polyimide foam
12. Describe pin and clip fastening systems
13. Describe multi-layer application of insulation.
14. Explain the importance of the sequencing of application when installing insulation materials.
15. Describe types of finish material their procedures for use and applications.
 - i. perforated metal
 - ii. RFFRK
 - iii. fabric finish system
 - iv. aluminium
 - v. steel
16. Explain stud and rail systems for installing finish material over insulation.

Practical Requirements:

1. Apply flexible and rigid insulation to tank heads.

HF3271 Blueprints II

Learning Outcomes:

- Demonstrate knowledge of reading and interpreting information from related construction drawings.

Duration: 30 Hours

Pre-Requisite(s): Level 2

Objectives and Content:

1. Demonstrate knowledge of reading, interpreting scale ruler and symbols in ledger.
2. Identify components of architectural drawings.
 - i. architectural sheets
 - ii. architectural drawings
3. Identify components of structural drawings.
 - i. structural drawings
 - identify symbols and abbreviations
 - interpret elevation markings
 - identify steel beams
4. Identify components of plumbing drawings.
 - i. domestic water system
 - ii. hot water
 - iii. cold water
 - iv. drainage
 - v. lines that need to be insulated
 - vi. lines that do not need to be insulated
5. Identify components of electrical drawings.
 - i. types of heat tracing
 - ii. exhaust pipe on emergency generator
6. Identify components of mechanical drawings.
 - i. insulation requirements of various sections of the HVAC system
 - ii. systems requiring insulation
7. Identify components and interpret ductwork drawings.

8. Identify components and interpret pipe drawings.
9. Describe the procedure to perform estimates of material quantities.

Practical Requirements:

1. Interpret and sketch drawings and diagrams.
2. Estimate materials required from a drawing.

Level 4

HF4070 Fire Stop System Installation II

Learning Outcomes:

- Demonstrate knowledge of fire stop systems for architectural, structural, mechanical and electrical components (advanced).
- Demonstrate knowledge of applying fire stop materials to architectural, structural, mechanical, and electrical components (advanced).

Duration: 24 Hours

Pre-Requisite(s): Level 3

Objectives and Content:

1. Describe purpose and reasons for different types of fire stop applications.
2. Identify measurements and calculations required for fire stop systems.
3. Identify types of fire stop materials used in fire stop systems.
 - i. caulking
 - ii. wrap strips
 - iii. intumescent boards and collars
 - iv. bricks
 - v. pillows
 - vi. putty
 - vii. mortar
 - viii. mineral fiber
 - ix. foams
 - x. cement
4. Calculate material requirements for fire stop systems.
5. Identify regulations pertaining to fire stop systems.
6. Describe material application techniques.
7. Identify types of cutting tools used to cut materials in fire stop installation.
 - i. saws
 - ii. snips
 - iii. knives

8. Identify types of tools used to fasten materials for fire stop system installation.
 - i. band tensioners
 - i. powder-actuated tools
 - ii. drills
 - iii. pin welders
 - iv. caulking guns
 - v. trowels

Practical Requirements:

1. Apply firestopping materials to various penetrations.
 - i. piping
 - ii. cable trays
 - iii. ductwork
 - iv. floor and ceiling

HF4080 Fireproofing Installation II

Learning Outcomes:

- Demonstrate knowledge of protective fireproofing materials.

Duration: 24 Hours

Pre-Requisite(s): Level 3

Objectives and Content:

1. Identify types of protective covering used to protect fireproofing materials.
2. Describe procedures used to cut protective coverings.
3. Describe procedures used to fabricate protective coverings.
4. Describe procedures used to spray protective coverings.
5. Identify types of fasteners used to fasten protective coverings.
 - i. screws
 - ii. rivets
 - iii. adhesives
 - iv. banding

Practical Requirements:

None.

HF4090 Removable Cover Installation (Hard Cover)

Learning Outcomes:

- Demonstrate knowledge of removable covers, their applications and the procedures used to fabricate them.
- Demonstrate knowledge of removable covers, their applications and the procedures used to fasten them.

Duration: 36 Hours

Pre-Requisite(s): Level 3

Objectives and Content:

1. Identify types of layout tools used to lay out removable covers.
2. Identify types of tools used to fabricate hard covers.
 - i. sheet metal brake
 - ii. lockformer
 - iii. easy edgers
 - iv. hand and power tools
3. Perform measurements and calculations for materials used to create drawings and fabricate removable covers.
4. Identify types of fastening devices used for hard covers.
 - i. rivets
 - ii. suitcase latches
 - iii. screws
 - iv. hinges
 - v. banding
5. Describe the procedures used to install fastening devices.
6. Describe procedures used to fit covers to equipment and fittings.

Practical Requirements:

1. Measure piping fittings for hard cover application.
2. Fabricate hard cover canister.

HF4041 Transitions and Reducers

Learning Outcomes:

- Demonstrate knowledge of patterns for transitions.
- Demonstrate knowledge of patterns for reducers.
- Demonstrate knowledge of procedures used to layout and develop patterns for transitions and reducers.

Duration: 24 Hours

Pre-Requisite(s): Level 3

Objectives and Content:

1. Explain the usage of math calculations related to introduction to transitions and reducers.
2. Describe the procedures used to layout patterns for square to round or round to square transition.
3. Describe the procedures used to develop a pattern for a cylindrical reducer (concentric reducer).
4. Describe the procedures used to develop pattern for square to square concentric reducer.
5. Describe how to layout pattern for eccentric reducing reducers.

Practical Requirements:

1. Make a pattern for reducers.
2. Make a pattern for transitions.

HF4100 Triangulation

Learning Outcomes:

- Demonstrate knowledge of triangulation.
- Demonstrate knowledge of types of applicable layouts.
- Demonstrate knowledge of procedures used to perform triangulation.

Duration: 30 Hours

Pre-Requisite(s): Level 3

Objectives and Content:

1. Perform the math calculations related to introduction to triangulation.
2. Describe triangulation.
3. Describe the procedures for triangulation.
 - i. true length lines
 - ii. Pythagorean theorem
4. Identify the basic geometry skills required for triangulation.
5. Identify the necessary view of object required for triangulation.
6. Identify the types of layouts produced by triangulation.

Practical Requirements:

1. Perform triangulation layout.

HF4120 Mentoring

Learning Outcomes:

- Demonstrate knowledge of strategies for learning skills in the workplace.
- Demonstrate knowledge of strategies for teaching workplace skills.

Duration: 6 Hours

Pre-Requisite(s): Level 3

Objectives and Content:

1. Describe the importance of individual experience.
2. Describe the shared responsibilities for workplace learning.
3. Determine one's own learning preferences and explain how these relate to learning new skills.
4. Describe the importance of different types of skills in the workplace.
5. Describe the importance of essential skills in the workplace.
 - i. reading
 - ii. writing
 - iii. document use
 - iv. oral communication
 - v. numeracy
 - vi. thinking skills
 - vii. working with others
 - viii. digital technology
 - ix. continuous learning
6. Identify and utilize different learning styles.
 - i. seeing it
 - ii. hearing it
 - iii. trying it
 - iv. applying it
7. Identify different learning needs and describe the strategies to meet these needs.
 - i. learning disabilities
 - ii. learning preferences
 - iii. language proficiency

8. Identify strategies to assist in learning a skill.
 - i. understanding basic principles of instruction
 - ii. developing coaching skills
 - iii. being mature and patient
 - iv. providing feedback
9. Identify different roles played by a workplace mentor.
10. Describe teaching skills.
 - i. identifying the point of the lesson
 - ii. linking the lesson
 - iii. demonstrating the skill
 - iv. providing practice
 - v. giving feedback
 - vi. assessing skills and progress
11. Explain the importance of identifying the lesson objective.
12. Identify how to choose a good time to present a lesson.
13. Explain the importance of linking the lesson.
14. Identify the components of the skill (the context).
15. Describe considerations in setting up opportunities for skill practice.
16. Explain the importance of giving feedback.
17. Identify techniques for giving effective feedback.
18. Describe a skills assessment.
19. Identify methods of assessing progress.
20. Explain how to adjust a lesson to different situations.

Practical Requirements:

None.

HF4110 Program Review

Learning Outcomes:

- Demonstrate knowledge of the Red Seal Occupational Standard (RSOS) and its relationship to the Plan of Training.
- Demonstrate knowledge of overall comprehension of the trade in preparation for the Red Seal Examination.

Duration: 30 Hours

Pre-Requisite(s): Level 3

Objectives and Content:

1. Define terminology associated with an RSOS.
 - i. levels
 - ii. major work activities
 - iii. tasks
 - iv. sub-tasks
2. Explain how an RSOS is developed and the link it has with the Red Seal Examination.
 - i. development
 - ii. validation
 - iii. level and task weighting
 - iv. examination breakdown (pie-chart)
3. Identify Red Seal products and describe their use for preparing for the Red Seal Examination.
 - i. Red Seal website
 - ii. examination preparation guide
 - iii. sample questions
 - iv. examination counselling sheets
4. Explain the relationship between the RSOS and the Plan of Training (POT).
5. Review Common Occupational Skills for the Insulator (Heat and Frost) trade as identified in the RSOS.
 - i. safety-related functions
 - ii. tools and equipment
 - iii. organizes work
 - iv. communication and mentoring

6. Review process to perform routine trade practices for the Insulator (Heat and Frost) trade as identified in the RSOS.
 - i. prepares measurements and calculations
 - ii. interprets specifications and drawings
 - iii. prepares substrates
7. Review process to perform industrial applications for the Insulator (Heat and Frost) trade as identified in the RSOS.
 - i. preparation for installation of insulation in industrial applications
 - ii. piping and fittings
 - iii. tanks, vessels and equipment
8. Review process to perform commercial applications for the Insulator (Heat and Frost) trade as identified in the RSOS.
 - i. prepares for installation of insulation in commercial applications
 - ii. insulates plumbing and mechanical piping systems
 - iii. insulates mechanical ducting
 - iv. insulates mechanical equipment
9. Review process to perform applications common to industrial and commercial systems for the Insulator (Heat and Frost) trade as identified in the RSOS.
 - i. installs fire stop systems
 - ii. insulates for soundproofing
 - iii. installs removable covers
 - iv. installs underground insulating systems
10. Review process to perform specialized applications for the Insulator (Heat and Frost) trade as identified in the RSOS.
 - i. spray sealers, coatings and spray-on insulation
 - ii. installs fireproofing
 - iii. installs insulation for refractory systems
 - iv. installs insulations for cryogenic systems
11. Review process to perform asbestos, lead and mould abatement for the Insulator (Heat and Frost) trade as identified in the RSOS.
 - i. prepares for asbestos abatement
 - ii. performs asbestos removal procedures
 - iii. performs maintenance and repair
 - iv. performs lead abatement and mould remediation

Practical Requirements:

None.

C. Conditions Governing Apprenticeship Training

1.0 General

The following general conditions apply to all apprenticeship training programs approved by the Provincial Apprenticeship and Certification Board (PACB) in accordance with the **Apprenticeship Training and Certification Act (1999)**. If an occupation requires additional conditions, these will be noted in the specific Plan of Training for the occupation. In no case should there be a conflict between these conditions and the additional requirements specified in a certain Plan of Training. All references to Memorandum of Understanding will also apply to Letter of Understanding (LOU) agreements.

2.0 Entrance Requirements

2.1 Entry into the occupation as an apprentice requires:

Indenturing into the occupation by an employer who agrees to provide the appropriate training and work experiences as outlined in the Plan of Training.

2.2 Notwithstanding the above, each candidate must have successfully completed a high school program or equivalent, and in addition may be required to have completed certain academic subjects as specified in a particular Plan of Training. Mature students, at the discretion of the Director of Apprenticeship and Trades Certification, may be registered. A mature student is defined as one who has reached the age of 19 and who can demonstrate the ability and the interest to complete the requirements for certification.

2.3 At the discretion of the Director of Apprenticeship and Trades Certification, credit toward the apprenticeship program may be awarded to an apprentice for previous work experience and/or training as validated through prior learning assessment.

2.4 An Application for Apprenticeship form must be duly completed along with a Memorandum of Understanding as applicable to be indentured into an Apprenticeship. The Memorandum of Understanding must contain signatures of an authorized employer representative, the apprentice and an official representing the Provincial Apprenticeship and Certification Board to be valid.

2.5 A new Memorandum of Understanding must be completed for each change in an employer during the apprenticeship term.

3.0 Probationary Period

The probationary period for each Memorandum of Understanding will be six months or 900 employment credit hours. Within that period, the memorandum may be terminated by either party upon giving the other party and the PACB one week notice in writing.

4.0 Termination of a Memorandum of Understanding

After the probationary period referred to in Section 3.0, the Memorandum of Understanding may be terminated by the PACB by mutual consent of the parties involved, or cancelled by the PACB for proper and sufficient cause in the opinion of the PACB, such as that stated in Section 14.

5.0 Apprenticeship Progression Schedule, Wage Rates and Advanced Training Criteria

Progression Schedule

Insulator (Heat and Frost) - 7200 Hours			
Apprenticeship Level and Wages			
Level	Wage Rate	Requirements for Progression to Next Level	Next Level
1	60%	<ul style="list-style-type: none"> ▪ Completion of Pre-Employment / Level 1 training ▪ Registration as an apprentice ▪ Pass Level 1 exam* ▪ Minimum 1800 hours of combined relevant work experience and training 	2 nd Year
2	70%	<ul style="list-style-type: none"> ▪ Completion of Level 2 training ▪ Pass Level 2 exam* ▪ Minimum 3600 hours of combined relevant work experience and training 	3 rd Year
3	80%	<ul style="list-style-type: none"> ▪ Completion of Level 3 training ▪ Pass Level 3 exam* ▪ Minimum 5400 hours of combined relevant work experience and training 	4 th Year
4	90%	<ul style="list-style-type: none"> ▪ Completion of Level 4 training ▪ Pass Level 4 exam* ▪ Minimum 7200 hours of combined relevant work experience and training ▪ Sign-off of all workplace skills in apprentice logbook ▪ Pass certification exam 	Journeyman Certification
<p>Wage Rates</p> <ul style="list-style-type: none"> ▪ Rates are percentages of the prevailing journeyman's wage rate in the place of employment of the apprentice. ▪ Rates must not be less than the wage rate established by the Labour Standards Act (1990), as now in force or as hereafter amended, or by other order, as amended from time to time replacing the first mentioned order. ▪ Rates must not be less than the wage rate established by any collective agreement which may be in force at the apprentice's workplace. ▪ Employers are free to pay wage rates above the minimums specified. <p>Level Exams*</p> <ul style="list-style-type: none"> ▪ This program may not currently contain level exams, in which case this requirement will be waived until such time as level exams are available. 			

Insulator (Heat and Frost) - 7200 Hours		
Class Calls (After Apprenticeship Registration)		
Call Level	Requirements for Class Call	Hours Awarded for In-School Training
Direct Entry Level 1	<ul style="list-style-type: none"> ▪ Minimum of 1800 hours of relevant work experience ▪ Prior Learning Assessment (PLA) at designated college (if applicable) 	As prescribed by the NLCS for the trade
Level 2	<ul style="list-style-type: none"> ▪ Minimum of 3000 hours of relevant work experience and training 	210
Level 3	<ul style="list-style-type: none"> ▪ Minimum of 5000 hours of relevant work experience and training 	180
Level 4	<ul style="list-style-type: none"> ▪ Minimum of 7030 hours of relevant work experience and training 	174
<p>Class Calls at Minimum Hours:</p> <ul style="list-style-type: none"> ▪ Class calls may not always occur at the minimum hours indicated. Some variation is permitted to allow for the availability of training resources and apprentices. 		

6.0 Tools

Apprentices shall be required to obtain their own hand tools applicable for the designated occupation of registration or tools as specified by the PACB.

7.0 Periodic Examinations and Evaluation

- 7.1 Every apprentice shall submit to such occupational tests and examinations as the PACB shall direct. If after such occupational tests and examinations the apprentice is found to be making unsatisfactory progress, his/her apprenticeship level and rate of wage shall not be advanced as provided in Section 5 until his/her progress is satisfactory to the Director of Apprenticeship and Trades Certification and his/her date of completion shall be deferred accordingly. Persistent failure to pass required tests shall be a cause for revocation of his/her Memorandum of Understanding.
- 7.2 Upon receipt of reports of accelerated progress of the apprentice, the PACB may shorten the term of apprenticeship and advance the date of completion accordingly.

7.3 For each and every course, a formal assessment is required for which 70% is the pass mark. A mark of 70% must be attained in both the theory examination and the practical project assignment, where applicable as documented on an official transcript.

7.4 Course credits may be granted through the use of a PACB approved matrix which identifies course equivalencies between designated trades and between current and historical Plans of Training for the same trade.

8.0 Granting of Certificates of Apprenticeship

Upon the successful completion of apprenticeship, the PACB shall issue a Certificate of Apprenticeship.

9.0 Hours of Work

Any hours employed in the performance of duties related to the designated occupation will be credited towards the completion of the term of apprenticeship. Appropriate documentation of these hours must be provided.

10.0 Copies of the Registration for Apprenticeship

The Director of Apprenticeship and Trades Certification shall provide copies of the Registration for Apprenticeship form to all signatories to the document.

11.0 Ratio of Apprentices to Journeypersons

Under normal practice, the ratio of apprentices to journeypersons shall not exceed two apprentices to every one journeyperson employed. Other ratio arrangements would be determined and approved by the PACB.

12.0 Relationship to a Collective Bargaining Agreement

Where applicable in Section 5 of these conditions, Collective Agreements take precedence.

13.0 Amendments to a Plan of Apprenticeship Training

A Plan of Training may be amended at any time by the PACB.

14.0 Employment, Re-Employment and Training Requirements

- 14.1 The Plan of Training requires apprentices to regularly attend their place of employment.
- 14.2 The Plan of Training requires apprentices to attend training for that occupation as prescribed by the PACB.
- 14.3 Failure to comply with Sections 14.1 and/or 14.2 will result in cancellation of the Memorandum of Understanding. Apprentices may have their MOUs reinstated by the PACB but would be subject to a commitment to complete the entire program as outlined in the General Conditions of Apprenticeship. Permanent cancellation in the said occupation is the result of non-compliance.
- 14.4 Cancellation of the Memorandum of Understanding to challenge journeyman examinations, if unsuccessful, would require an apprentice to serve a time penalty of two (2) years before reinstatement as an apprentice or qualifying to receive a class call to training as a registered Trade Qualifier. Cancellation must be mutually agreed upon by the employer and the apprentice.
- 14.5 An employer shall ensure that each apprentice is under the direct supervision of an approved journeyman supervisor who is located at the same worksite as the apprentice, and that the apprentice is able to communicate with the journeyman with respect to the task, activity or function that is being supervised.
- 14.6 Under the Plan of Training the employer is required to keep each apprentice employed as long as work is available, and if the apprentice is laid off due to lack of work, to give first opportunity to be hired before another is hired.
- 14.7 The employer will permit each apprentice to attend training programs as prescribed by the PACB.
- 14.8 Apprentices who cannot acquire all the workplace skills at their place of employment will have to be evaluated in a simulated work environment at a PACB authorized training institution and have sign-off done by instructors to meet the requirements for certification.

15.0 Appeals to Decisions Based on Conditions Governing Apprenticeship Training

Persons wishing to appeal any decisions based on the above conditions must do so in writing to the Minister of Immigration, Skills and Labour within 30 days of the decision.

D. Requirements for Red Seal Endorsement

1. Evidence the required work experiences outlined in this Plan of Training have been obtained. This evidence must be in a format clearly outlining the experiences and must be signed by an appropriate person or persons attesting that these experiences have been obtained to the level required.
2. Successful completion of all required courses in the program.
3. A combination of training from an approved training program and suitable work experience totaling 7200 hours.

Or

A total of 10,800 hours of suitable work experience.

4. Completion of a National Red Seal examination, to be set at a place and time determined by the Apprenticeship and Trades Certification Division.

E. Roles and Responsibilities of Stakeholders in the Apprenticeship Process

The apprenticeship process involves a number of stakeholders playing significant roles in the training of apprentices. This section outlines these roles and the responsibilities resulting from them.

The Apprentice:

- completes all required technical training courses as approved by the PACB.
- finds appropriate employment.
- completes all required work experiences in combination with the required hours.
- ensures work experiences are well documented.
- approaches apprenticeship training with an attitude and commitment that fosters the qualities necessary for a successful career as a qualified journeyman.
- obtains the required hand tools as specified by the PACB for each period of training of the apprenticeship program.

The Employer:

- provides high quality work experiences in an environment conducive to learning.
- remunerates apprentices as set out in the Plan of Training or Collective Agreements.
- provides feedback to training institutions, Apprenticeship and Trades Certification Division and apprentices in an effort to establish a process of continuous quality improvement.
- where appropriate, releases apprentices for the purpose of returning to a training institution to complete the necessary technical courses.
- ensures work experiences of the apprentice are documented.
- ensures a certified journeyperson is currently on staff in the same trade area as the apprentice and whose certification is recognized by the NL Department of Immigration, Skills and Labour.

The Training Institution:

- provides a high quality learning environment.
- provides the necessary student support services that will enhance an apprentice's ability to be successful.
- participates with other stakeholders in the continual updating of programs.

The Apprenticeship and Trades Certification Division:

- establishes and maintains program advisory committees under the direction of the PACB.
- promotes apprenticeship training as a viable career option to prospective apprentices and other appropriate persons involved, such as career guidance counsellors, teachers, parents, etc.
- establishes and maintains a protocol with training institutions, employers and other appropriate stakeholders to ensure the quality of apprenticeship training programs.
- ensures all apprentices are appropriately registered and records are maintained as required.
- schedules all necessary technical training periods for apprentices to complete requirements for certification.
- administers level, provincial and interprovincial examinations.

The Provincial Apprenticeship and Certification Board:

- sets policies to ensure the provisions of the **Apprenticeship and Certification Act (1999)** are implemented.
- ensures advisory and examination committees are established and maintained.
- accredits institutions to deliver apprenticeship training programs.
- designates occupations for apprenticeship training and/or certification.