



**PROVINCIAL PLAN OF TRAINING**

**FOR THE**

**INSULATOR (HEAT & FROST)**

**OCCUPATION**

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Approved – September 2007			
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## **ADDENDUM #1**

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- 1. COURSE NUMBER USED FOR CUSTOMER SERVICE WAS AN OLD NUMBER (MR 1200) – UPDATED NUMBER FOR CUSTOMER SERVICE IS MR 1220.**

## **PREFACE**

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This Apprenticeship Standard is based on the 2000 edition of the National Occupational Analysis for the Insulator (Heat & Frost) trade. This document describes the curriculum content for the Insulator (Heat & Frost) apprenticeship training program and outlines each of the technical training units necessary for the completion of apprenticeship.

## **ACKNOWLEDGEMENT**

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Advisory committees, industry representatives, instructors and apprenticeship staff provided valuable input to the development of this Apprenticeship Curriculum Standard. Without their dedication to quality apprenticeship training, this document could not have been produced. A sincere thank you.

# **Apprenticeship Curriculum Standard Evaluation Form**

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Thank you for your interest in the development and revision of this document. Upon review of this document, please record your feedback in relation to the following items:

- unit division and organization
- relevancy of the content
- errors or omissions
- other suggestions for improvement and consideration

Overall comments are to be entered on this evaluation form and specific changes are to be entered directly on the document in the relevant area(s). When making proposed corrections(s) in the curriculum standard, please use red ink. When all feedback has been recorded, return this evaluation form along with the curriculum standard to the Apprenticeship Office noted at the bottom of the page.

(PLEASE PRINT)

Trade: \_\_\_\_\_ Insulator (Heat and Frost) \_\_\_\_\_

Full Name: \_\_\_\_\_

Type of Position: (Trade Practitioner, Instructor, etc.) \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_\_

Comments: (Use a separate sheet of paper if necessary)

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Return Evaluation Form and Curriculum Standard to:

*Manager, Industrial Training  
Division of Institutional and Industrial Education  
Department of Education  
P.O. Box 8700  
St. John's, NL  
A1B 4J6*

## TABLE OF CONTENTS

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Preface.....	i
Acknowledgement.....	ii
Evaluation Form .....	iii
Conditions Governing Apprenticeship Training .....	1
Requirements for Red Seal Certification for Apprentices .....	7
Roles and Responsibilities of Stakeholders in the Apprenticeship Process.....	8
Program Outcomes .....	10
Program Structure .....	11
Program Content.....	16
Basic Math .....	69
 REQUIRED RELATED COURSES	
Workplace Communications.....	72
Customer Service.....	74
Quality Assurance/Quality Control.....	76
Introduction to Computers .....	78
Workplace Skills .....	82
Job Search Techniques.....	84
Entrepreneurial Awareness .....	86
Appendix A: - Insulator (heat & frost) Tool and Equipment List.....	88

## **CONDITIONS GOVERNING APPRENTICESHIP TRAINING**

### **1.0 GENERAL**

The following general conditions will apply to all apprenticeship training programs approved by the Provincial Apprenticeship and Certification Board in accordance with the Apprenticeship Training and Certification Act. Where an occupation requires additional conditions, these will be noted in the specific plan of training for that occupation. In no case should there be a conflict between these conditions and the additional requirements specified in certain plans of training.

### **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 this 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 particular plans of training. Mature students, at the discretion of the Director of Institutional and Industrial Education, 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 Institutional and Industrial Education, credit towards the apprenticeship program may be awarded to an apprentice for previous work experience and/or training as validated through prior learning assessment.

2.4 A Registration for Apprenticeship form must be duly completed.

### **3.0 PROBATIONARY PERIOD**

The probationary period for each memorandum of understanding will be six months. Within that period the memorandum may be terminated by either party upon giving the other party and the Provincial Apprenticeship and Certification Board one week notice in writing.

#### 4.0 TERMINATION OF A MEMORANDUM OF UNDERSTANDING

After the probationary period referred to in Section 3.0 herein, the memorandum of understanding may be terminated by the Board by mutual consent of the parties thereto or cancelled by the Board for proper and sufficient cause in the opinion of the Board.

#### 5.0 APPRENTICESHIP PROGRESSION SCHEDULE AND WAGE RATES

##### 5.1 Progression Schedule

<b>7200 Hour Programs</b>	<b>Requirements for Progression</b>	<b>Progress To</b>
First Year Apprentice	Completion of entry level (Block 1) courses, plus relevant work experience totaling a minimum of 1800 hours *	Second Year
Second Year Apprentice	Completion of advanced level (Block 2) courses, plus relevant work experience totaling a minimum of 3600 hours	Third Year
Third Year Apprentice	Completion of advanced level (Block 3) courses, plus relevant work experience totaling a minimum of 5400 hours	Fourth Year
Fourth Year Apprentice	Completion of advanced level (Block 4) courses and (Block 5) <i>if applicable</i> , plus sign-off of workplace skills required for certification totaling a minimum of 7200 hours**	Write Certification Examination
<b>5400 Hour Programs</b>	<b>Requirements for Progression</b>	<b>Progress To</b>
First Year Apprentice	Completion of entry level (Block 1) courses, plus relevant work experience totaling a minimum of 1800 hours *	Second Year
Second Year Apprentice	Completion of advanced level (Block 2) courses, plus relevant work experience totaling a minimum of 3600 hours	Third Year
Third Year Apprentice	Completion of advanced level (Block 3) courses, plus sign-off of workplace skills required for certification totaling a minimum of 5400 hours	Write Certification Examination



4800 Hour Programs	Requirements for Progression	Progress To
First Year Apprentice	Completion of entry level courses (Block 1) courses, plus relevant work experience totaling a minimum of 1600 hours *	Second Year
Second Year Apprentice	Completion of advanced level (Block 2) courses, plus relevant work experience totaling a minimum of 3200 hours	Third Year
Third Year Apprentice	Completion of advanced level (Block 3) courses, plus sign-off of workplace skills required for certification totaling a minimum of 4800 hours	Write Certification Examination

\* All direct entry apprentices must meet the **Requirements for Progression** either through Prior Learning Assessment and Recognition or course completion before advancing to the next year.

\*\* Apprentices in a 7200 hour program which incorporates more than four blocks of training are considered fourth year apprentices pending completion of 100% course credits and workplace skills requirements.

5.2 For the duration of each Apprenticeship Training Period, the apprentice, who is not covered by a collective agreement, shall be paid a progressively increased schedule of wages which shall not be less than:

Program Duration	Wage Rates		Comments
<b>7200 Hours</b>	1 <sup>st</sup> Year	55%	These wage rates are percentages of the prevailing journey person's wage rate in the place of employment of the apprentice. No apprentice shall be paid less than the wage rate established by the Labour Standards Act (1988), as now in force or as hereafter amended, or by other Order, as amended from time to time replacing the first mentioned Order.
	2 <sup>nd</sup> Year	65%	
	3 <sup>rd</sup> Year	75%	
	4 <sup>th</sup> Year	90%	
<b>5400 Hours and 4800 Hours</b>	1 <sup>st</sup> Year	55%	
	2 <sup>nd</sup> Year	70%	
	3 <sup>rd</sup> Year	85%	
<b>4000 Hours</b>			(Hairstylist Program) - The apprentice shall be paid no less than the minimum wage for hours worked and a commission agreed upon between the apprentice and the employer.

## **6.0 TOOLS**

Apprentices shall be required to obtain hand tools as and when specified by the Board.

## **7.0 PERIODIC EXAMINATIONS AND EVALUATION**

7.1 Every apprentice shall submit to such occupational tests and examinations as the Board shall direct. If after such occupational tests and examinations the apprentice is found to be making unsatisfactory progress, his/her rate of wage shall not be advanced as provided in Section 5 until his/her progress is satisfactory to the Director of Institutional and Industrial Education 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 Board 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. At the discretion of the instructor, the summative mark may be for completion of a theory examination or a combination of the theory examination and an assigned practical project.

## **8.0 GRANTING OF CERTIFICATES OF APPRENTICESHIP**

Upon the successful completion of apprenticeship, the Board 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 Institutional and Industrial Education shall provide copies of the Registration for Apprenticeship form to all signatories to the document.

## **11.0 RATIO OF APPRENTICES TO JOURNEYPERSONS**

The ratio of Apprentices to Journeypersons normally shall not exceed one apprentice to every one journeyperson employed. Exceptions for specific occupations may occur with the approval of the Provincial Apprenticeship and Certification Board.

## **12.0 RELATIONSHIP OF THE PLAN OF TRAINING TO A COLLECTIVE BARGAINING AGREEMENT**

Collective agreements take precedence over the conditions outlined in the plan of training.

## **13.0 AMENDMENTS TO A PLAN OF APPRENTICESHIP TRAINING**

A plan of training may be amended at any time by the Provincial Apprenticeship and Certification Board.

## **14.0 EMPLOYMENT, RE-EMPLOYMENT AND TRAINING REQUIREMENTS**

14.1 The plan of training requires Apprentices to attend regularly their place of employment.

14.2 The plan of training requires Apprentices to regularly attend training programs for that occupation as prescribed by The Provincial Apprenticeship and Certification Board.

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 M.O.U.'s reinstated by the Provincial Apprenticeship and Certification Board 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 journeyperson examinations, if unsuccessful, would require an apprentice to serve a time penalty of two (2) years before reinstatement as an apprentice or registering as a Trade Qualifier.

14.5 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 opportunity to be re-employed before another is hired.

14.6 The employer will permit each apprentice to attend regularly training programs as prescribed by the Provincial Apprenticeship and Certification Board.

14.7 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 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 Education within 30 days of the decision.

## **REQUIREMENTS FOR RED SEAL CERTIFICATION FOR APPRENTICES**

1. Evidence that the required work experiences outlined in this plan of training have been obtained. This evidence must be in a format that clearly outlines 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 program.
3. A combination of training from an approved training program and suitable work experience totalling 5400 hours
4. Completion of a National Red Seal examination, to be set at a place and time determined by the Industrial Training Division.
5. Payment of the appropriate examination fee.

## **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 captures, in a broad sense, these roles and the responsibilities that result from them.

### **The Apprentice**

- ▶ to complete all required technical training courses as approved by the Provincial Apprenticeship and Certification Board.
- ▶ to find appropriate employment.
- ▶ to complete all required work experiences in combination with the required hours.
- ▶ to ensure that the work experiences are well documented.
- ▶ to approach apprenticeship training with an attitude and commitment that fosters the qualities necessary for a successful career as a qualified journeyman.
- ▶ to obtain the required hand tools as specified by the Board for each period of training of the apprenticeship program.

### **The Employer**

- ▶ to provide high quality work experiences in an environment that is conducive to learning.
- ▶ to remunerate apprentices as set out in this Plan of Training or Collective Agreements.
- ▶ to provide feedback to Training Institutions, Industrial Training Division and Apprentices in an effort to establish a process of continuous quality improvement.
- ▶ where appropriate, to release apprentices for the purpose of returning to a training institution to complete the necessary technical courses.
- ▶ to ensure that work experiences of the apprentices are documented.

### **The Training Institution**

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

### **The Industrial Training Division**

- ▶ to establish and maintain program advisory committees under the direction of the Provincial Apprenticeship and Certification Board.
- ▶ to promote apprenticeship training as a viable career option to prospective apprentices and other appropriate persons involved, such as career guidance counsellors, teachers, parents, etc.
- ▶ to establish and maintain a protocol with training institutions, employers and other appropriate stakeholders to ensure the quality of apprenticeship training programs.
- ▶ to ensure that all apprentices are appropriately registered and records are maintained as required.
- ▶ to schedule all necessary technical training periods for apprentices to complete requirements for certification.
- ▶ to administer provincial/interprovincial examinations.

### **The Provincial Apprenticeship and Certification Board**

- ▶ to set policies to ensure that the provisions of the Apprenticeship Training and Certification Act are implemented.
- ▶ to ensure that advisory and examination committees are established and maintained.
- ▶ to accredit institutions to deliver apprenticeship training programs.
- ▶ to designate occupations for apprenticeship training and/or certification.

## **PROGRAM OUTCOMES**

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Upon completion of the Insulator (Heat and Frost) program, students will have demonstrated the knowledge and skills required to perform the following tasks:

- Task 1        Determines administrative requirements.
- Task 2        Determines production requirements.
- Task 3        Determines site specific requirements.
- Task 4        Checks substrate for readiness.
- Task 5        Cleans up site after jobs.
- Task 6        Insulates for thermal applications.
- Task 7        Fabricates insulation for tanks, vessels and fittings.
- Task 8        Fabricates removable covers.
- Task 9        Installs protective coverings.
- Task 10       Applies sealants.
- Task 11       Insulates for refractory applications. (1 500°F +).
- Task 12       Insulates for cryogenic applications. (-150°F to absolute zero).
- Task 13       Installs underground insulating systems.
- Task 14       Insulates for sound proofing. (Industrial Application)
- Task 15       Applies fire proofing materials.
- Task 16       Insulates plumbing systems.
- Task 17       Insulates mechanical systems.
- Task 18       Insulates HVAC (heating, ventilation, and air conditioning) systems.
- Task 19       Insulates fittings.
- Task 20       Installs finishing materials.
- Task 21       Insulates for sound proofing. (Commercial Application)
- Task 22       Determines scope of work (unique to this area of the trade).
- Task 23       Removes asbestos in high risk conditions.
- Task 24       Performs maintenance repair.
- Task 25       Encloses asbestos.
- Task 26       Encapsulates asbestos.
- Task 27       Sprays insulations.
- Task 28       Sprays sealers and coatings.
- Task 29       Maintains spray equipment.
- Task 30       Determines required fire stopping system.
- Task 31       Installs fire stopping.



## PROGRAM STRUCTURE

The units listed below are required technical training in the Insulator (Heat and Frost) Apprenticeship Program.

<b>NL Course No.</b>	<b>Course Name</b>	<b>Hours</b>	<b>Pre-Requisites</b>	<b>Page No.</b>
TS-1510	Occupational Health and Safety	6	None	16
TS-1520	WHIMIS	6	None	19
TS-1530	First Aid	14	None	22
HF-1100	Hand and Power Tools	6	None	23
HF-1110	Shop Tools and Equipment	15	None	25
HF-1150	Insulation Principles	10	None	26
HF-1200	Insulation Materials	10	None	28
HF-1210	Insulation Practices	10	None	30
HF-1220	Introduction to Pipe and Pipe Systems	10	None	31
HF-1230	Installing Pipe Insulation	75	HF-1200 HF-1210	32
HF-1240	Hot Work Practices	20	None	34
HF-1250	Introduction to Asbestos	24	TS-1520	36
HF-1260	Asbestos Removal Procedures	24	HF-1250	38
HF-1270	Blueprint Reading Part 1	30	None	40
HF-1280	Introduction to Foam Insulation	10	None	42
HF-1290	Installation of Flexible Foam Insulation	30	HF-1280	43
HF-1300	Air Handling System Components	10	None	45
HF-1310	Blanket Insulation	15	None	46
HF-1320	Fibrous Board Insulation	15	None	47
HF-1330	Insulating Breeching, Flues and Precipitators	10	None	48
HF-1340	Insulating Methods (Cylinders and Heads)	30	None	49
HF-1350	Finishing Methods	15	None	51
HF-1360	Introduction to Cryogenic Work	10	None	52
HF-1370	Insulating Cryogenic Systems	25	HF-1360	53
HF-1380	Insulate Underground Piping	25	None	55
HF-1400	Parallel Line Development	20	None	56
HF-1410	Radial Line Development	20	None	57
HF-1420	Triangulation	15	None	58
HF-1500	Tees, Valves and Elbows	35	None	59

<b>NL Course No.</b>	<b>Course Name</b>	<b>Hours</b>	<b>Pre-Requisites</b>	<b>Page No.</b>
HF-1510	Flanges and End Caps	30	None	61
HF-1520	Cones, Bevels and Transitions	25	None	62
HF-1540	Tank Heads	15	None	64
HF-2270	Blueprint Reading –Part II	35	HF-1270	65
HF-1550	Firestopping	25	None	67
*MA-1060	Basic Math	60	None	69
CM-2150	Workplace Communication	45	None	72
<b>MR-1220</b>	<b>Customer Service</b>	<b>30</b>	None	74
SP-2330	Quality Assurance/Quality Control	30	None	76
MC-1050	Introduction to Computers	30	None	78
SD-1700	Workplace Skills	30	None	82
SD-1710	Job Search Techniques	15	None	84
SD-1720	Entrepreneurial Awareness	15	None	86
	<b>TOTAL:</b>	930		

The following tables outline the block structure for the Insulator (Heat and Frost) Program.

<b>ENTRY LEVEL BLOCK 1</b>		
<b>Code</b>	<b>Title</b>	<b>Hours</b>
TS-1510	Occupational Health and Safety	6
TS-1520	WHIMIS	6
TS-1530	First Aid	14
HF1100	Hand and Power Tools	6
HF1110	Shop Tools and Equipment	15
*MA-1060	Basic Math	60
CM-2150	Workplace Communication	45
MR-1220	Customer Service	30
SP-2330	Quality Assurance/Quality Control	30
MC-1050	Introduction to Computers	30
SD-1700	Workplace Skills	30
SD-1710	Job Search Techniques	15
SD-1720	Entrepreneurial Awareness	15
HF1150	Insulation Principles	10
HF1200	Insulation Materials	10
HF1210	Insulation Practices	10
HF1220	Introduction to Pipe and Piping Systems	10
HF1310	Blanket Insulation	15
HF1320	Fibrous Board Insulation	15
HF1230	Installing Pipe Insulation	75
HF1240	Hot Work Practices	20
HF1250	Introduction to Asbestos	24
HF1260	Asbestos Removal Procedures	24
HF1550	Firestopping	25
HF1270	Blueprint Reading – Part 1	30
	<b>Total</b>	<b>570</b>

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**PROGRAM STRUCTURE (CONTINUED)**

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	<b>BLOCK 2</b>	
<b>Code</b>	<b>Title</b>	<b>Hours</b>
HF1280	Introduction to Foam Insulation	10
HF1290	Installation of Flexible Foam Insulation	30
HF1300	Air Handling System Components	10
HF1380	Insulate Underground Pipe	25
HF1400	Parallel Line Development	20
HF1410	Radial Line Development	20
HF1500	Tees, Valves and Elbows	35
HF1510	Flanges and End Caps	30
	<b>Block 2 Total:</b>	180

**PROGRAM STRUCTURE (CONTINUED)**

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	<b>BLOCK 3</b>	
<b>Code</b>	<b>Title</b>	<b>Hours</b>
HF1330	Insulating Breeching, Flues and Precipitators	10
HF1340	Insulating Methods (Cylinders and Heads) (Math)	30
HF1350	Finishing Methods	15
HF1360	Introduction to Cryogenic Work	10
HF1370	Insulating Cryogenic Systems	25
HF2270	Blueprint Reading – Part II	35
HF1420	Triangulation	15
HF1520	Cones, Bevels and Transitions	25
HF1540	Tank Heads	15
	<b>Block 3 Total:</b>	180

## TS-1510 OCCUPATIONAL HEALTH AND SAFETY

### Description:

This course is designed to give participants the knowledge and skills necessary to interpret the Occupational Health and Safety Act, laws and regulations; understand the designated responsibilities within the laws and regulations; the right to refuse dangerous work; and the importance of reporting accidents.

### Course Outcomes:

Upon successful completion of this unit, the apprentice will be able to:

- prevent accidents and illnesses
- improve health and safety conditions in the workplace

### Theory:

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 & 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
  - iv) Health and safety representation
  - v) Reporting endangerment to health
  - vi) Appropriate remedial action
  - vii) Investigation of endangerment
  - viii) Committee recommendation
  - ix) 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 Industrial 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 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:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

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.



## **TS-1520           WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)**

### **Description:**

This course is designed to give participants the knowledge and skills necessary to define WHMIS, examine hazard identification and ingredient disclosure, explain labeling and other forms of warning, and introduce material safety data sheets (MSDS).

### **Course Outcomes:**

Upon successful completion of this course, the apprentice will be able to:

- interpret and apply the Workplace Hazardous Materials Information System (WHMIS) Regulation under the Occupational Health & Safety Act.

### **Required Knowledge and Skills:**

1. Define WHMIS safety.
  - i) Rational 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.
  1. Prohibited, restricted and controlled products
  2. Classification and the application of WHMIS information requirements
  3. 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 device

- 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:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

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.

**SUGGESTED RESOURCES:**

1. WHMIS Regulation.
2. Sample MSDS sheets.

## **TS-1530**

## **FIRST AID**

### **Description:**

This course is designed to give the apprentice the ability to recognize situations requiring emergency action and to make appropriate decisions concerning first aid.

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

## HF1100

## Hand and Power Tools

### Outcomes:

Upon successful completion of this course, the apprentice will be able to

- identify basic hand and power tools (heat & frost)
- use hand & power tools

### Objectives and Content:

1. Describe general safety requirements for use of hand & power tools
2. Identify common hand tools.
  - i) hammers
  - ii) screw drivers
  - iii) pliers and wire cutters
  - iv) levels
  - v) squares
  - vi) measuring tools
  - vii) clamps and temporary holding devices
  - viii) saws
  - ix) banding gear
  - x) sheet metal shears
  - xi) Dividers
  - xii) Knives
3. Describe the procedures to use and maintain various hand tools.
4. Identify common power tools.
  - i) drills and drill bits
  - ii) saws
  - iii) hand grinder
  - x) stud and pin welder
5. Describe the procedures to use and maintain power tools.
6. Identify safety consideration when using hand and power tools.

**Practical:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

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

## HF1110

## Shop Tools and Equipment

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- identify shop tools and equipment
- use shop tools and equipment
- maintain shop tools and equipment

### Objectives and Content:

1. Describe safety precautions to be considered when working with shop tools and equipment.
2. Identify various shop tools and equipment.
  - i) lock former
  - ii) EZ edger
  - iii) combination machine (Beader/Crimper)
  - iv) sheet metal break
  - v) metal shear
  - vi) metal roller
  - vii) band saw
  - viii) pedestal grinder
3. Describe the procedures to operate shop tools and equipment.
4. Identify maintenance procedures for shop tools and equipment.

### Practical:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Use and maintain various shop tool and equipment.

## HF1150

## Insulation Principles

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- demonstrate general knowledge of insulating principles
- identify systems requiring insulation.

### Objectives and Content:

1. Define terminology relating to the insulating occupation.
  - i) heat related terms
  - ii) cold related terms
  - iii) thermal temperature range
2. Describe the principles and function of insulation.
3. Identify the factors to be considered in selection of insulation.
  - i) insulating ability
  - ii) temperature
    - ambient temperature
    - service temperature
  - iii) location
  - iv) durability
  - v) compatibility
  - vi) cost
4. Identify the various systems requiring insulation.
  - i) commercial
    - plumbing
      - domestic hot and cold water lines
      - roof drains
    - heating
      - boiler
      - piping
      - vessels
      - chilled water lines
      - ducts
      - emergency generators
  - ii) industrial
    - process piping systems
    - large and small vessels
    - boilers
    - breaching
    - stacks
    - precipitators
    - tanks



**Practical:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

-No Practical

## HF1200

## Insulation Materials

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- identify insulation materials and accessories
- describe procedures for use of insulator materials and accessories.

### Objectives and Content:

1. Identify insulation materials and their characteristics.
  - i) composition
    - fibrous
    - cellular
    - granular
  - ii) configurations
  - iii) characteristics
  - iv) temperature range
    - upper limit
    - lower limit
  
2. Identify application materials and where they are used.
  - i) wires
  - ii) bands
  - iii) adhesives
  - iv) tape
  - v) screws
  - vi) rivets
  - vii) tacks
  - i) hog rings
  - ii) Pins & clips
  - iii) Studs
  
3. Identify covering, finishes and sealants used in insulating.
  - i) bore coatings
  - ii) adhesives
  - iii) mastics
  - iv) reinforcement materials
  - v) cements
  - vi) jacketing materials
  - vii) protectors
  - viii) Identify mixing procedures for;
    - adhesives
    - powders

4. Identify the procedures for handling, storing and distributing insulation materials.
  - i) delivery
  - ii) stacking
  - iii) storage
  - iv) moving materials
  - v) proper housekeeping procedures

**Practical:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

- No Practical

## HF1210

## Insulation Practices

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- describe basic procedures for insulating at various temperature ranges.

### Objectives and Content:

1. Describe the basic procedures involved in insulating.
  - i) moderate temperature
  - ii) hot temperature
  - iii) cold
    - low temperature
    - vapor barrier

### Practical:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

- No Practical

## HF1220 Introduction to Pipe and Piping Systems

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- identify and describe piping systems that require insulating.

### Objectives and Content:

1. Identify the types of pipes and their characteristics.
  - i) types of pipe
    - heat traced piping
    - steam
    - electric
  - ii) thermal expansion of pipe for hot systems
  
2. Identify the components of a piping system.
  - i) straight thermal piping
  - ii) joints
  - iii) irregular surfaces
    - connectors
    - valves
    - fittings
  - iv) hangers
    - clevis hanger
    - pipe shoe on roller support
    - contact hangers

### Practical:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

- No Practical

## HF1230

## Installing Pipe Insulation

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- demonstrate knowledge of the procedures to install pipe insulation
- select material for pipe insulation

### Objectives and Content:

1. Perform the Math Calculations related to Installing Pipe Insulation.
2. Describe the procedures for installing plain insulation (no jacketing) on a straight run of pipe.
  - i) hot piping systems
  - ii) install with tape, wire or bands
  - iii) establish stagger pattern
3. Describe the procedure used to apply fiberglass insulation with all service jacket (ASJ).
  - i) butt strips
  - ii) staples
  - iii) self sealing lap (SSL)
4. Describe the procedures for trimming insulation.
  - i) pipe welds
  - ii) bevel for flanged fittings
5. Describe the procedures for insulating at hangers.
  - i) contact hangers
  - ii) clevis hangers
  - iii) pipe shoe on roller supports
  - iv) anchors
6. Describe the procedures for insulating pipe fittings, valves and flanges.
  - i) factory moulded or machined
  - ii) mitered segments
    - long and short radius elbows
    - determine size and number of miters
    - methods of measuring and cutting miter
    - methods of attaching miter sections
  - iii) built up insulation covers
    - blanket
    - cement
    - soft cover

- iv) insulating at Tees @ 90°
    - equal
    - unequal
  - v) insulating laterals
    - equal
    - unequal
  - vi) in-line flanges
  - vii) insulating valves
    - body
    - bonnet
  - viii) insulating reducer
    - Concentric
    - Eccentric
7. Describe the procedures to finish insulated pipe.
- i)unjacketed
  - ii) cloth jacketing or reinforced mastic (canvas)
  - iii) plastic jacketing
  - iv) metal jacketing
  - v) cement finish jacketing

### **Practical:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Insulate pipe and various fittings using fibreglass insulation.
2. Insulate pipe and various fittings using mineral wool.
3. Insulate pipe and various fittings using calcium silicate.
4. Finish an insulated component using a cement finish.

## HF1240

## Hot Work Practices

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- identify hot work environments.
- describe procedures to work safely in hot work environment

### Objectives and Content:

1. Define “hot work” and its relation to the insulator occupation.
2. Describe the health effects that can result when working in hot work environments.
  - i) body’s ability to cool itself
    - blood circulation
    - sweating
  - ii) effect of hot work on the body’s cooling system
    - metabolic heat
  - iii) heat disorders
    - symptoms
    - treatments
3. Describe the procedures to prevent heat disorders when working in hot work environments.
  - i) workplace prevention
    - hot work supervisor
    - schedules
    - worker’s records
  - ii) monitoring hot work areas
    - wet bulb globe thermometer
    - determine stay times
    - acclimatization
  - iii) personal prevention
    - knowledge of personal medical/work history
    - knowledge of personal limits
4. Identify site setup methods.
  - i) hot work conditions
    - setting up a workplace
    - proper steps
      - posting signs
      - shutting off ventilation system
      - shutting off electricity
    - correct procedure bringing in
      - extension cords



- scaffolds
  - large equipment
  - how to
    - build a decontamination unit
    - hook up negative air machines
5. Identify personal protective clothing.
- i) special protective clothing
    - hot work areas
    - cooling suits
    - ice vests
    - fireproof suits
6. Identify fire protection techniques.
- i) fires on a hot work site
    - proper prevention measures
    - high temperatures create dangerous atmosphere
    - flammable materials
    - fire extinguishers
    - log book
    - emergency exits
    - emergency phone numbers
    - preplanned escape plan

**Practical:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

- No Practical

## HF1250

## Introduction to Asbestos

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- identify asbestos types
- describe procedures to work safely with asbestos

### Objectives and Content:

1. Identify the types of asbestos and their characteristics.
  - i) dangers of asbestos
    - why asbestos is dangerous
    - when asbestos is dangerous
  - ii) possible locations of asbestos
  - iii) safe identification of asbestos
    - bulk samples
    - lab reports
  - iv) other safety issues relating to asbestos removal
    - heat
    - chemicals
    - electric shock
    - fire
    - tight places
    - scaffolds and ladders
    - slipping and tripping
2. Describe personal health and medical issues relating to asbestos.
  - i) symptoms and effects of asbestos on the body
    - latency period (how long it takes to get sick from exposure)
    - amount of asbestos that can cause illness
  - ii) functions of the human respiratory system
  - iii) effects of smoking in relation to asbestos exposure
  - iv) medical exams for workers exposed to asbestos
    - timing and frequency of exams
    - what should be included in the medical exam
    - keeping records of medical exams
      - employee
      - employer
      - physician
3. Identify types of personal protective equipment used in asbestos work.
  - i) respirators
  - ii) disposable suits
  - iii) boots (rubber)
  - iv) specialty Personal Protection Equipment for hot work

4. Identify the types of respirators used on asbestos abatement.
  - i) Air Purifying Respirator (APR)
  - ii) Supplied Air Respirator (SAR)
5. Describe the procedures used to ensure use of a respirator is possible.
  - i) tests to ensure proper fit
    - qualitative test
    - quantitative test
    - negative pressure and positive pressure test
6. Describe the procedures used to determine which respirator is suitable for the job.
  - i) protection factor of respirator
  - ii) maximum use level (MUL)
7. Describe the procedures used to inspect, care for and maintain respirators.
8. Identify equipment used in asbestos abatement.
  - i) negative air machine
    - purpose
    - function
    - determining volume of air required
    - calculating number of machines required
  - ii) High Efficiency Particulate Air (HEPA Vacs)
    - HEPA filters on power tools
    - HEPA filters in vacuum cleaners
9. Describe the procedures used to control asbestos.
  - i) enclosure
  - ii) encapsulation
  - iii) repair
  - iv) removal
  - v) operations and maintenance program

### **Practical:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Perform fit test of personal respirator

## HF1260 Asbestos Removal Procedures

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- describe procedures used to remove asbestos.
- use Personal Protection Equipment

### Objectives and Content:

1. Describe the procedures to set-up for asbestos abatement.
  - i) air sampling before set-up
  - ii) Personal Protective Equipment required
  - iii) pre-cleaning work area
  - iv) posting of signs
  - v) electrical and ventilation shut-down
  - vi) moving in large equipment
  - vii) set-up of De-con Unit
  - viii) containing work area
    - critical barriers
  - ix) entering and exiting work area
    - pre-planned escape route
  - x) placement and hook-up of negative air machines
  - xi) identification of possible changes required for set-up in hot work area
    - fire and heat resistant material
    - increased number of negative air machines
  
2. Describe methods used for removing asbestos.
  - i) air sampling during removal
    - area sampling
    - personal air monitoring
  - ii) removing asbestos from walls, ceilings and pipes
    - keeping out of the air
    - keeping asbestos wet
  - iii) variations to normal procedures for hot work removal
    - dry removal
    - special tools
    - vacuum loaders
    - bagging of asbestos waste
  
3. Describe the procedures for clean-up and disposal of asbestos.
  - i) bagging of asbestos waste
    - type of bag
    - proper loading
  - ii) cleaning work area
    - spray lock down

- take down poly
  - dispose with other asbestos containing materials
  - waste load out
  - iii) disposal of asbestos waste once it leaves the job site
    - air-tight containers
    - properly labeled
    - approved sanitary land fill
  - iv) air sampling upon job completion
    - aggressive air sampling
    - clearance air test
4. Describe removal procedures for maintenance related (small) jobs.
- i) mini enclosure
  - ii) glove bags

**Practical:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Perform a mock suit-up for entrance into a potential contaminated environment
2. Set up a small mock-up in a containment area to demonstrate a negative air pressure. Include proper design and construction of a containment area.

## HF1270

## Blueprint Reading - Part 1

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- be able to identify basic information from blueprints or drawings.
- interpret basic information from blueprints or drawings
- prepare basic drawings and diagrams

### 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, 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:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Interpret and sketch basic drawings and diagrams.

## HF1280

## Introduction to Foam Insulation

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- identify characteristics of foam insulation
- identify applications of foam insulation

### Objectives and Content:

1. Identify the characteristics and applications of elastomeric foam insulation.
2. Identify and describe the forms of foam insulation.
  - i) pipe
  - ii) sheet
  - iii) rolls
3. Identify types and characteristics of adhesives used on flexible foam insulation.
  - i) contact type
  - ii) safe use
    - flammable when wet

### Practical:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

- No Practical



## HF1290 Installation of Flexible Foam Insulation

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- describe procedures used to install flexible foam insulation and its accessories.
- use flexible foam insulation

### Objectives and Content:

1. Describe the procedures used to install flexible foam insulation using the slip on insulation method.
  - i) insulating pipe fittings
    - tees
    - ells
2. Describe the procedures used to insulate screwed fittings.
3. Describe the procedures used to apply slit tubes.
4. Describe the procedures used to create fitting covers from pipe insulation.
  - i) single miter (stove pipe) fitting covers.
    - sweated joints
    - screwed joints
  - ii) sleeve types fitting covers
    - 90° ells
    - cross fittings
    - 45° ells
    - laterals
    - tees and valves
5. Describe the procedures used to create and apply sheet fabricated fitting covers.
  - i) lay-out short of long radius ells
    - use manufacturer's templates (available for most common fittings)
    - use charts for measurements
    - take measurements from pipe
  - ii) apply fitting cover to short or long radius ells
    - before or after adjacent pipe insulation
  - iii) fabricate flanged valve covers
    - donuts
    - build out valve body
    - measure flange circumference
    - measure and cut insulation to fit valve body
    - measure and cut insulation to fit bonnet

6. Describe the procedures used to install flexible foam insulation at hangers.
  - i) high density inserts
  - ii) metal shields
  - iii) vapor barrier
  
7. Describe the procedures used to install flexible foam sheets to ductwork and equipment.
  - i) determine cut sizes
  - ii) apply adhesive to both surfaces
  - iii) use compression joints for butt joints
  - iv) standing seams
  - v) apply protective coatings

**Practical:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Install flexible foam insulation to copper piping and various pieces of equipment.

## HF1300 Air Handling System Components

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- identify air handling systems and components related to the Insulator occupation.
- describe air handling systems and components related to the Insulator occupation

### Objectives and Content:

1. Identify the various types of air handling systems and their applications.
2. Identify and describe components of an air handling system (HVAC).
  - i) fresh air intake
  - ii) supply air
  - iii) return air
  - iv) relief air
  - v) exhaust air
  - vi) main (trunk)
  - vii) riser
  - viii) branch
  - x) run-out
  - xi) diffuser

### Practical:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

-No Practical

## HF1310

## Blanket Insulation

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- describe the procedures for installing blanket insulation.
- use blanket insulation

### Objectives and Content:

1. Describe the procedures for measuring and cutting fibrous blanket.
  - i) calculate perimeter or circumference of duct
  - ii) make allowances for insulation thickness
  - iii) add for overlap
2. Describe the procedures used to apply blanket duct insulation.
  - i) application methods
    - straight duct
    - duct bends
    - elbow on round duct
      - miter segments (gores)
    - reducers
  - ii) fastening methods
3. Describe the procedures of sealing to provide vapor barrier.

### Practical:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Apply blanket insulation to duct bends, elbows, reducers and hangers.

## HF1320

## Fibrous Board Insulation

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- describe the procedures for installing fibrous board insulation on duckwork.
- use the procedures for installing fibrous board insulation on duckwork

### Objectives and Content:

1. Describe the procedures for measuring and cutting fibrous board.
  - i) measure duct and make allowances for thickness of insulation
  - ii) cut to leave little waste
  - iii) kerfing or v-groove tool
2. Describe the procedures used to install board insulation on rectangular duct.
  - i) fastening procedures
  - ii) applying insulation to elbows
  - iii) applying insulation to standing ribs and stiffeners
3. Describe the procedures used to install board insulation on round or oval duct.
  - i) placement and cutting of v-grooves
  - ii) calculating circumference of insulated duct
  - iii) cutting mitre segments for elbows
4. Describe the procedures used to seal fiberglass board.

### Practical:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Install fibrous board insulation on duct work.

## HF1330 Insulating Breeching, Flues and Precipitators

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- describe the procedures used to insulate breechings and the use of associated equipment.
- use insulation on breaching

### Objectives and Content:

1. Describe the procedures used to provide air space.
  - i) rectangular surface
  - ii) cylindrical surface
2. Describe the procedures to insulate round breechings.
  - i) apply blanket or rigid-wrap
    - using bands
    - using metal mesh blanket
3. Describe the procedures used to insulate rectangular breechings.
  - i) applying block insulation
  - ii) fastening methods
    - stand-offs
4. Describe the procedures for pin welding.
  - i) types of pin welders
    - Capacitor Discharge (CD)
    - Stud Weld
  - ii) types of pins and studs
  - iii) placement of pins
5. Describe the procedures used to finish ducts and breechings.
  - i) applying canvass
  - ii) applying PVC
  - iii) applying metal jacketing

### Practical:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Apply insulation to a Breeching.

## HF1340 Insulating Methods (Cylinders and Heads)

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- describe the procedures used to insulate tank heads and cylinders with rigid insulation
- describe the procedures used to insulate tank heads and cylinders insulation flexible insulation
- use rigid insulation
- use flexible insulation

### Objectives and Content:

1. Describe the procedures used to insulate cylinders with rigid insulation.
  - i) measure and cut lags
    - calculate lag size
      - given diameter
      - given circumference
    - calculate bevel on lag
  - ii) score or kerf board insulation
  - iii) create expansion joints for hot work
  - iv) fastening insulation to substrate surface
  - v) temporary holding of materials
  - vi) cylinder legs or supports
  - vii) use of chokers
2. Describe the procedures used to insulate tank heads with rigid insulation.
  - i) types (shapes) of tank heads
  - ii) top heads
    - application of insulation to large and small heads
  - iii) bottom heads
    - chokers and pigtail wires
  - iv) on hot work
  - v) on cold work
3. Describe the procedures used to insulate cylinders with flexible fibrous insulation.
  - i) proper installation methods
  - ii) use of support bars on large diameter vessels
  - iii) insulating tank head with flexible fibrous insulation

**Practical:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Apply flexible and rigid insulation to tank heads.



## HF1350

## Finishing Methods

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- describe the procedures used to apply finishes to tank heads and cylinders.
- use finishing materials on tank heads

### Objectives and Content:

1. Describe the procedures used to finish heads.
  - i) apply canvass
  - ii) apply mastic
  - iii) apply metal gores
2. Describe the procedures used to finish bodies of cylinders.
  - i) apply canvass
  - ii) apply metal jacketing
  - iii) apply plastic jacketing

### Practical:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Apply finishing material to tank heads.

## **HF1360**

## **Introduction to Cryogenic Work**

### **Outcomes:**

Upon the successful completion of this unit, the apprentice will be able to

- describe the properties of cryogenic work
- identify the types of insulation material used in cryogenic work.

### **Objectives and Content:**

1. Define cryogenic work.
2. Explain the importance vapor pressure plays in cryogenic insulation work.
3. Identify the types of insulation material used in cryogenic temperature ranges.

### **Practical:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

- No Practical

## HF1370                      Insulating Cryogenic Systems

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- describe the procedures used to insulate cryogenic systems.
- use foam glass

### Objectives and Content:

1. Describe the procedures used to install cellular glass or rigid foam to pipes and equipment for cryogenic service.
  - i) all joints staggered
  - ii) applied in several layers
  - iii) sealing joints
  - iv) vapor stops
  - v) expansion/contraction joints
  - vi) at pipe supports and hangers
  - vii) external vapor barrier required
  
2. Describe the procedures used to insulate pipe connectors between prefabricated insulated pipe sections.
  - i) foam in place
    - calculate volume required
    - factor expansion rate of foam
    - snap time of foam product
    - forms required
    - methods to deliver foam
  
3. Describe the procedures to insulate pipe by foaming in place.
  - i) setting of forms
  - ii) delivery of foam product
  
4. Describe the procedures used to insulate a tank shell using particulate insulation.
  - i) application of particulate
  - ii) sealing the vessel once insulation is in place
  
5. Describe the procedures used to insulate pipes or equipment by packing in mineral wool.
  - i) equipment or pipes encased in metal box
    - mineral wool packed to desired density

**Practical:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

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

## HF1380 Insulate Underground Piping

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- describe the procedures used to insulate, seal, and finish underground piping.
- use insulation for underground piping

### Objectives and Content:

1. Describe the procedures used to insulate underground piping using pipe covering.
  - i) application procedures
  - ii) insulating connectors
  
2. Describe the procedures used to seal and finish underground piping.
  - i) lines
    - reinforced laminated asphalt based jacket
    - primer and membrane
    - polyethylene film
  - ii) connectors

### Practical:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Apply insulation to piping in preparation for underground installation.

## HF1400

## Parallel Line Development

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- demonstrate knowledge of parallel line development.
- identify types of applicable layouts.
- describe procedures used to perform parallel line development.

### Objectives and Content:

1. Perform the Math Calculations related to Introduction to parallel Line Development.
2. Describe parallel line development.
3. Describe the procedures for parallel line development.
4. Identify the basic geometry skills required for parallel line development.
5. Identify the necessary views of object required for parallel line development.
6. Identify the types of layout that can be produced by parallel line development.

### Practical:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Perform basic parallel line development as per job sheet

## HF1410

## Radial Line Development

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- demonstrate knowledge of radial line development.
- identify types of applicable layouts.
- describe procedures used to perform radial line development.

### Objectives and Content:

1. Perform the Math Calculations related to Introduction to Radial Line Development.
2. Describe radial line development.
  - i) importance of the apex
3. Describe the procedures used for radial line development.
4. Identify the basic geometry skills required for radial line development.
5. Identify the necessary views of object required for radial line development.
6. Identify the types of layouts that can be produced by radial line development.

### Practical:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Perform basic radial line development as per job sheet

## HF1420

## Triangulation

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- demonstrate knowledge of triangulation.
- identify types of applicable layouts.
- describe procedures used to perform triangulation.

### 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 that can be produced by triangulation.

### Practical:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Perform basic triangulation development as per job sheet.



## HF1500

## Tees, Valves and Elbows

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- describe procedures used to develop patterns for tees, valves, and elbows.
- construct patterns for tees, valves, and elbows

### Objectives and Content:

1. Perform the Math Calculations related to Introduction to Tees, Valves and Elbows.
2. Describe the procedures used to develop patterns for equal tee or valve.
  - i) layout template
  - ii) layout pattern for main or body
  - iii) layout pattern for branch or bonnet
  - iv) demonstrate how to provide for water-shed
3. Describe the procedures used to develop patterns for unequal tee or valve.
  - i) layout template
  - ii) layout pattern for main or body
  - iii) layout pattern for branch or bonnet
  - iv) demonstrate how to provide for water-shed
4. Describe the procedures used to develop patterns for long radius elbow.
  - i) use of mitre charts
  - ii) basic layout
    - radius of elbow
    - allowances for bead and crimp
  - iii) stretch out for gores
    - identify right and left gores
5. Describe the procedures to develop patterns for segmented (stove pipe) elbow.
  - i) basic layout
    - allowances for bead and crimp
  - ii) stretch out for gores
6. Describe the procedures to develop patterns for short radius elbow.
  - i) basic layout
    - radius of elbow
    - allowances for bead and crimp
  - ii) stretch out for gores
  - iii) layout of butterfly throat

**Practical:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Make gore elbow, tee, and valves out of aluminum.

## HF1510

## Flanges and End-caps

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- describe procedures used to develop patterns for flanges and end-caps.
- construct patters for flanges and end-caps

### Objectives and Content:

1. Perform the Math Calculations related to Introduction to Flanges and End-caps.
2. Describe the procedures to develop patterns for flanges.
  - i) three partial patterns
  - ii) flange thickness
  - iii) edge covers
  - iv) adjoining pipe
  - v) demonstrate how to provide for water-shed
  - vi) tools and equipment required to finish and apply finished product to the insulated surface.
3. Describe the procedures to develop patterns for end-caps.
  - i) one piece end-cap
  - ii) two piece end-cap

### Practical:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Apply insulation to flanges and end-caps.

## HF1520                      Cones, Bevels and Transitions

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- describe procedures used to layout and develop patterns for cones, bevels, and transitions.
- construct patterns for cones, bevels and transitions

### Objectives and Content:

1. Perform the Math Calculations related to Introduction to Cones, Bevels and Transitions.
2. Describe the procedures used to produce layout for 45° bevel.
  - i) drawn with a series of concentric circles
  - ii) identify measurements required
  - iii) calculation of the size of material required for pattern layout
  - iv) allowances for bead and crimp
  - v) tools and equipment required to finish and apply the finished product to the insulated surface
3. Describe the procedures used to develop pattern for a cylindrical cone (concentric reducer).
  - i) identify measurement required
  - ii) calculation of the size of material required for pattern layout
  - iii) describe how to finish pattern for water-shed and adjoining pieces
  - iv) tools and equipment required to finish and apply the finished product to the insulated surface
4. Describe the procedures used to develop pattern for square to square concentric reducer.
  - i) identify measurements required
  - ii) calculation of the size of material required for pattern layout
  - iii) describe how to finish pattern for water-shed and adjoining pieces
  - iv) tools and equipment required to finish and apply the finished product to the insulated surface
5. Describe the procedures used to layout pattern for square to round or round to square transition.
  - i) using triangulation method of development
  - ii) using radial line development
  - iii) identify which views are required
  - iv) identify measurements required
  - v) calculation of the size of material required for pattern layout
  - vi) describe how to finish pattern for water-shed and adjoining pieces
  - vii) tools and equipment required to finish and apply the finish product to the insulated surface

6. Describe how to layout pattern for eccentric reducing cones.
  - i) using triangulation method of development
  - ii) using radial line development
  - iii) identify which views are required
  - iv) identify measurements required
  - v) calculation of the size of material required for pattern layout
  - vi) describe how to finish pattern for water-shed and adjoining pieces
  - vii) tools and equipment required to finish and apply the finish product to the insulated surface

**Practical:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Make a pattern for cones,
2. Make a pattern for bevels
3. Make a pattern for transitions

## HF1540

## Tank Heads

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- describe procedures used to layout patterns for tank heads.

### Objectives and Content:

1. Describe the procedures used to layout pattern for tank heads.
2. Explain the use of starter piece, center piece and anchor strips.
3. Identify starter gore, closing gore, right and left gores.
4. Explain the steps to do a snap line head gore.
  - i) identify measurements required
  - ii) transfer measurements to layout
  - iii) allowance for bead and crimp
5. Describe layout for flat or conical head gores.

### Practical:

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Make and apply gores to tank heads.

## HF2270

## Blueprint Reading – Part II

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- read and interpret information from related construction drawings.

### Objectives and Content:

1. Read architectural drawings.
  - i) architectural sheets
    - items of information
  - ii) architectural drawings
    - know way around
    - quickly find out general information about a new building
2. Read structural drawings.
  - i) use structural drawings
    - proper manner
    - find information
    - correctly interpret elevation markings
    - identify steel beams by codes
      - marked on structural drawings
3. Read plumbing drawings.
  - i) use plumbing drawings
  - ii) find necessary information
    - domestic water system
      - hot water
      - cold water
      - drainage
      - sewer connections
  - iii) read plumbing drawings to determine
    - lines that need to be insulated
    - line that do not need to be insulated
4. Read electrical drawings.
  - i) read electrical drawings to
    - find where the heat tracing is being used
  - ii) exhaust pipe on emergency generator to be insulated
    - carrying out asbestos abatement work
    - electrical drawings are used to
      - determine fixtures to be removed
      - power outlets to be located
5. Read mechanical drawings.
  - i) use mechanical drawings to find information on

- insulation requirements of various sections of the HVAC system
  - what parts of that system require insulation to be installed
6. ductwork drawings.
    - i) read drawings to find information regarding ductwork
  7. Read pipe drawings.
    - i) read drawings to find information regarding piping

**Practical:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Interpret and sketch drawings and diagrams.



## HF1550 Firestopping

### Outcomes:

Upon the successful completion of this unit, the apprentice will be able to

- identify and explain the characteristics of firestopping materials.
- describe the procedures to install firestopping.
- use firestopping materials

### Objectives and Content:

1. Explain the basics of firestopping.
  - i) introduction to firestopping
    - various definitions
    - process
    - approved
      - installations
      - materials
    - responsibilities of
      - stakeholders involved in the firestopping industry
2. Identify firestopping materials.
  - i) firestopping materials
    - different types
      - intumescent
      - endothermic material
      - silicones
      - grout
      - nonburnable materials
    - firestopping systems
3. Describe how to install firestopping.
  - i) install firestopping
    - methods
    - product information
    - safety concerns during installation
  - ii) installing damming materials
  - iii) installing liquid foams
  - iv) temporary forms
  - v) placing the liquid
  - vi) calculating volume to be filled
  - vii) calculating amount of mix
  - viii) installing intumescent materials
  - ix) installing wrap strip
  - x) installing aluminum tape
  - xi) composite sheet
  - xii) proper way to finish the job

4. Describe firestopping systems.
  - i) various systems
  - ii) methods to select proper system

**Practical:**

Practical skills enhance the apprentices' ability to meet the objectives of this course. The learning objectives outlined below are **mandatory** in Newfoundland and Labrador, but are provided as suggestions for Nova Scotia, Prince Edward Island and New Brunswick.

1. Apply firestopping materials to various penetrations.

**\*MA-1060**

**BASIC MATH**

**Description:**

This course in Basic Math requires knowledge of general mathematical concepts and processes to enable trades persons to function in the institutional setting by developing numeracy skills required for technical courses. This math course should also provide a foundation for experiential learning through knowledge of math relating to on-the-job skills and practices. A detailed course outline is available from the Department of Education, Industrial Training Section to training institutions upon request.

**Course Outcomes:**

1. To develop numeracy skills and knowledge required for institutional and on-the-job learning.
2. To develop the capability to apply mathematical concepts in the performance of trade practices.
3. To develop an appreciation for mathematics as a critical element of the learning environment
4. To use mathematical principles accurately for the purposes of problem solving, job and materials estimation, measurement, calculation, system conversion, diagram interpretation and scale conversions, formulae calculations, and geometric applications.

**Prerequisites:**

**Course Duration:** 60 hrs.

**Course Objectives (Knowledge):**

1. Define and calculate using whole number operations.
2. Define and demonstrate use of correct orders of operations.
3. Demonstrate examples of operations with fractions and mixed numbers.
4. Demonstrate examples of operations with decimals.
5. Demonstrate examples of operations with percentages.
6. Employ percent/decimal/fraction conversion and comparison.
7. Define and calculate with ratios and proportions.

8. Use the Imperial Measurement system in relevant trade applications.
9. Use the Metric Measurement system in relevant trade applications.
10. Perform Imperial/Metric conversions.
11. Define and demonstrate the formulation of variables.
12. Demonstrate and define the various properties of angles and make relevant calculations.

**Major Tasks/Sub-tasks (Skills):**

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

## **REQUIRED RELATED COURSES**

## **CM-2150                      WORKPLACE COMMUNICATIONS**

### **Description:**

This course is designed to introduce students to the principles of effective communication including letters, memos, short report writing, oral presentations and interpersonal communications.

### **Course Outcomes:**

Upon completion of the course, students will be able to:

- understand and apply communication skills as outlined in the Employability Skills 2000, Conference Board of Canada.
- understand the importance of well-developed writing skills in business and in career development.
- understand the purpose of the various types of business correspondence.
- examine the principles of effective business writing.
- examine the standard formats for letters and memos.
- write effective letters and memos.
- examine the fundamentals of informal reports and the report writing procedure.
- produce and orally present an informal report.
- examine effective listening skills and body language in communication.

### **Objectives and Content:**

1. Apply rules and principles for writing clear, concise, complete sentences which adhere to the conventions of grammar, punctuation, and mechanics.
2. Explain the rules of subject-verb agreement.
3. Define and describe the major characteristics of an effective paragraph.

Examine the Value of Business Writing Skills.

- i) Describe the importance of effective writing skills in business
  - ii) Describe the value of well-developed writing skills to career success as referenced in the Employability Skills
5. Examine Principles of Effective Business Writing.
- i) Discuss the rationale and techniques for fostering goodwill in business communication, regardless of the circumstances
  - ii) Review the importance of revising and proofreading
  - iii) Differentiate between letter and memo applications in the workplace & review samples
  - iv) Identify the parts of a business letter and memo
  - v) Review the standard formats for business letters and memos
  - vi) Examine samples of well-written and poorly written letters and memos

- vii) Examine guidelines for writing sample letters and memos which convey: acknowledgment, routine request, routine response, complaint, refusal, persuasive request and letters of appeal.
- 6. Examine the Fundamentals of Informal Business Reports
    - i) Identify the purpose of the informal report
    - ii) Identify the parts and formats of an informal report
    - iii) Identify methods of information gathering
    - iv) Describe the methods of referencing documents
    - v) Review the importance of proof reading and editing
  - 7. Examine types of presentations
    - i) Review & discuss components of an effective presentation
    - ii) Review & discuss delivery techniques
    - iii) Review & discuss preparation & use of audio/visual aids
    - iv) Discuss & participate in confidence building exercises used to prepare for giving presentations
  - 8. Interpersonal Communications
    - i) Examine and apply listening techniques
    - ii) Discuss the importance of body language

**Practical:**

- 1. Write well-developed, coherent, unified paragraphs which illustrate the following: A variety of sentence arrangements; conciseness and clarity; and adherence to correct and appropriate sentence structure, grammar, punctuation, and mechanics.
- 2. Write sample letters and memos which convey: acknowledgment, routine request, routine response, complaint, refusal, persuasive request and letters of appeal.
- 3. Gather pertinent information, organize information into an appropriate outline & write an informal report with documented resources.
  - i) Edit, proofread, and revise the draft to create an effective informal report and present orally using visual aids
  - ii) Participate in confidence building exercises
- 5. Present an effective presentation.
- 6. Evaluate presentations.

## MR-1220

## CUSTOMER SERVICE

### Description:

This course focuses on the role of providing quality customer service. It is important to have a positive attitude and the necessary skills to effectively listen and interpret customer concerns about a product, resolve customer problems, and determine customer wants and needs. Students will be able to use the skills and knowledge gained in this course to effectively provide a consistently high level of service to the customer.

### Course Outcomes:

Upon successful completion of this course, students will be able to:

- define customer service
- explain why service is important
- describe the relationship between “service” and “sales”
- demonstrate an understanding of the importance of a positive attitude
- demonstrate methods of resolving customer complaints

### Objectives and Content:

1. Define quality service.
  - i) Identify and discuss elements of customer service
  - ii) Explain the difference between Service vs. Sales or Selling
  - iii) Explain why quality service is important
  - iv) Identify the various types of customers & challenges they may present
  - v) Describe customer loyalty
  - vi) Examine barriers to quality Customer Service
2. Explain how to determine customer’s wants and needs.
  - i) Identify customer needs
  - ii) Explain the difference between customer wants and needs
  - iii) Identify ways to ensure repeat business
3. Demonstrate an understanding of the importance of having a positive attitude.
  - i) Identify & discuss the characteristics of a positive attitude
  - ii) Explain why it is important to have a positive attitude
  - iii) Explain how a positive attitude can improve a customer’s satisfaction
  - iv) Define perception and explain how perception can alter us and customers
  - v) Describe methods of dealing with perception
4. Communicating effectively with customers.
  - i) Describe the main elements in the communication process
  - ii) Identify some barriers to effective communication
  - iii) Explain why body language is important



- iv) Define active listening and state why it is important
  - v) Identify and discuss the steps of the listening process
  - vi) Identify and discuss questioning techniques
5. Demonstrate using the telephone effectively.
- i) Explain why telephone skills are important
  - ii) Describe the qualities of a professional telephone interaction
6. Demonstrate an understanding of the importance of asserting oneself.
- i) Define assertiveness
  - ii) Discuss assertive techniques
  - iii) Explain the use of assertiveness when dealing with multiple customers
7. Demonstrate techniques for interacting with challenging customers in addressing complaints & resolving conflict.
- i) Examine & discuss ways to control feelings
  - ii) Examine & discuss ways to interact with an upset customer
  - iii) Examine & discuss ways to resolve conflict/customer criticism
  - iv) Examine & discuss ways to prevent unnecessary conflict with customers

**Practical:**

1. Participate in activities to demonstrate knowledge of the course objectives.

## **SP-2330      QUALITY ASSURANCE/QUALITY CONTROL**

### **Description:**

This course is designed to give students an understanding of the concepts and requirements of QA/QC such as, interpreting standards, controlling the acceptance of raw materials, controlling quality variables and documenting the process. It includes information on quality concepts, codes and standards, documentation, communications, human resources, company structure and policy, teamwork and responsibilities.

### **Course Outcomes:**

Upon completion of this course, students will be able to:

- develop the skills and knowledge required to apply quality assurance/quality control procedures as related to the trade
- develop an awareness of quality principles and processes
- apply quality assurance/quality control procedures in a shop project

### **Objectives & Content:**

1. Describe the reasons for quality assurance and quality plans.
2. Explain the relationship between quality assurance and quality control.
3. Describe quality control procedures as applied to the production and checking of specifications and processes in applicable occupations.
4. Describe quality control procedures as applied to the acceptance and checking of raw materials.
5. Explain the role of communications in a quality environment.
6. Explain why it is important for all employees to understand the structure of the company and its production processes.
7. Explain how human resource effectiveness is maximized in a quality managed organization.
8. Explain the role of company policy in quality management.
9. Explain the purpose of codes and standards in various occupations.
10. Explain the concepts of quality
  - i) cost of quality
  - ii) measurement of quality
  - iii) elements of quality

- iv) elements of the quality audit
  - v) quality standards
  - vi) role expectations and responsibilities
11. Explain the structure of quality assurance and quality control.
- i) Describe organizational charts
  - ii) Identify the elements of a quality assurance system such as ISO, CSA, WHMIS, Sanitation Safety Code (SSC)
  - iii) Explain the purpose of the quality assurance manual
  - iv) Describe quality assurance procedures
12. Examine quality assurance/quality control documentation.
- i) Describe methods of recording reports in industry
  - ii) Describe procedures of traceability (manual and computer-based recording)
  - iii) Identify needs for quality control procedures

**Practical:**

1. Apply quality control to a project.
- i) Follow QA/QC procedures for drawings, plans and specifications in applicable occupations.
  - ii) Calibrate measuring instruments and devices in applicable occupations.
  - iii) Interpret required standards
  - iv) Follow QA/QC procedures for accepting raw materials
  - v) Carry out the project
  - vi) Control the quality elements (variables)
  - vii) Complete QA/QC reports

## MC-1050 INTRODUCTION TO COMPUTERS

### Description:

This course is designed to give the student an introduction to computer systems. Particular emphasis is given to word processing, spreadsheet, e-mail and the Internet and security issues.

### Course Outcomes:

Upon completion of this course, students will have a basic understanding of:

- computer systems and their operation.
- popular software packages, their applications
- security issues of Computers

### Objectives & Content:

1. Identify the major components of microcomputer system hardware and software system.
2. Describe the functions of the microprocessor.
  - i) Describe and give examples of I/O DEVICES
  - ii) Describe primary storage (RAM, ROM, Cache)
  - iii) Define bit, byte, code and the prefixes k.m. and g
  - iv) Describe secondary storage (diskettes and hard disks, CD ROMS, Zip Drives etc)
  - v) Describe how to care for a computer and its accessories
3. Describe microcomputer software.
  - i) Define software
  - ii) Describe types of operational and application software
  - iii) Define file and give the rules for filenames and file extensions
4. Describe windows software.
  - i) Start and quit a Program
  - ii) Demonstrate how to use the help function
  - iii) Locate a specific file using the **find** function
  - iv) Identify system settings: wall paper, screen saver, screen resolution, background
  - v) Start a program by using the Run Command
  - vi) Shutting down your computer
5. Identify File Management commands.
  - ii) Demonstrate how to view directory structure and folder content
  - iii) Organize files and folders
  - iv) Copy, delete, and move files and folders

- v) Create folders
  - vi) Maximize and minimize a window
  - vii) Describe windows task bar
6. Describe Keyboards.
- i) Identify and locate alphabetic and numeric keys
  - ii) Identify and locate function key & special keys
7. Describe Word Processing.
- i) Describe Windows components
  - ii) Menu bar
  - iii) Menu indicators
  - iv) Document window
  - v) The Status bar
  - vi) The Help feature
  - vii) Insertion point movements
8. Describe the procedure used to development of a document.
- i) Enter text
  - ii) Change the display
9. Describe the procedure for opening, saving and exiting documents.
- i) Saving a document
  - ii) Closing a document.
  - iii) Starting a new document Window
  - iv) Opening a document
  - v) Exiting word processor
10. Describe the procedure for editing a Document.
- i) Adding new text
  - ii) Deleting text
  - iii) Using basic format enhancement (split and join paragraphs, insert text)
11. Describe the main Select Features.
- i) Identify a selection
  - ii) Moving a selection
  - iii) Copying a selection
  - iv) Deleting a selection
  - v) Saving a selection
12. Explain how to change Layout Format.
- i) Changing layout format: (margins, spacing, alignment, paragraph indent, tabs, line spacing, page numbering)
13. Explain how to change Text Attributes.
- i) Changing text attributes: (bold, underline, font, etc.)

14. Describe the Auxiliary Tools.
  - i) Using Spell Check & Thesaurus
15. Describe Print features.
  - i) Selecting the Print Feature: (i.e; number of copies and current document)
  - ii) Identifying various options in print screen dialogue box
16. Examine & Discuss Electronic Spreadsheet.
  - i) Spreadsheet Basics
  - ii) The Worksheet Window
17. Describe Menus.
  - i) Menu Bar
  - ii) Control menu
  - iii) Shortcut menu
  - iv) Save, Retrieve form menus
18. Describe the components of a worksheet.
  - i) Entering constant values and formulas
  - ii) Using the Recalculation feature
19. Describe Use ranges.
  - i) Typing a range for a function
  - ii) Pointing to a range for a function
  - iii) Selecting a range for toolbar and menu commands
20. Describe how to print a worksheet
  - i) Printing to the Screen
  - ii) Printing to the Printer
  - iii) Printing a selected Range
21. Describe how to edit a worksheet.
  - i) Replacing cell contents
  - ii) Inserting & deleting rows and columns
  - iii) Changing cell formats
  - iv) Changing cell alignments
  - v) Changing column width
  - vi) Copying and moving cells
22. State major security issues in using computers.
  - i) Pass words
  - ii) Accessing accounts
  - iii) Viruses and how they can be avoided
  - iv) Identity theft and ways to protect personal information

23. Describe how to use Electronic Mail.
  - i) E-mail etiquette
  - ii) E-mail accounts
  - iii) E-mail messages
  - iv) E-mail message with attachments
  - v) E-mail attachments
  - vi) Print e-mail messages
  - vii) Deleting e-mail messages
  
24. Explain the Internet and its uses.
  - i) The World Wide Web(www)
  - ii) Accessing Web sites
  - iii) Internet Web Browsers
  - iv) Internet Search Engines
  - v) Searching Techniques
  - vi) Posting documents on-line

**Practical:**

1. Create a document using Word Processing.
2. Complete word processing exercises to demonstrate proficiency in word processing.
3. Prepare and send e-mails with attachments.
4. Retrieve documents and e-mail attachments and print copies.
5. Develop & print a spread sheet.
6. Post a document on-line.

## SD-1700

## WORKPLACE SKILLS

### Description:

This course involves participating in meetings, information on formal meetings, unions, workers' compensation, employment insurance regulations, workers' rights and human rights.

### Course Outcomes:

Upon completion of this course, students will be able to:

- Participate in meetings
- Define and discuss basic concepts of:
  - unions
  - workers' compensation
  - employment insurance
  - workers' rights
  - human rights
  - workplace diversity
  - gender sensitivity

### Objectives & Content:

1. Meetings
  - i) Identify & discuss meeting format and preparation required for a meeting.
  - ii) Explain the purpose of an agenda.
  - iii) Explain the roles and responsibilities of meeting participants.
  - iv) Explain the purpose of motions and amendments and withdrawals.
  - v) Explain the procedure to delay discussion of motions.
  - vi) Explain the voting process.
2. Unions
  - i) State why unions exist.
  - ii) Give a concise description of the history of Canadian labour.
  - iii) Explain how unions function.
  - iv) Explain labour's structure.
  - v) Describe labour's social objectives.
  - vi) Describe the relationship between Canadian labour and the workers.
  - vii) Describe the involvement of women in unions.
3. Worker's Compensation
  - i) Describe the aims, objectives, benefits and regulations of the Workplace Health, safety and Compensation Commission.
  - ii) Explain the internal review process.



4. Employment Insurance
  - i) Explain employment insurance regulations.
  - ii) Describe how to apply for employment insurance.
  - iii) Explain the appeal process.
  - iv) Identify the components of a letter of appeal.
  
5. Worker's Rights
  - i) Define labour standards.
  - ii) Explain the purpose of the Labour Standards Act.
  - iii) Identify regulations pertaining to:
    - Hours of work
    - Minimum wages
    - Employment of children
    - Vacation pay
  - iv) Explain the purpose of the Occupational Health & Safety Act as it refers to workers' rights.
  
6. Human Rights
  - i) Describe what information cannot be included on an employment application.
  - ii) Describe what information cannot be included in an interview.
  - iii) Examine the Human Rights Code and explain the role of the Human Rights Commission.
  - iv) Define harassment in various forms and identify strategies for prevention.
  
7. Workplace Diversity
  - i) Define and explore basic concepts and terms related to workplace inclusively including age, race, culture, religion, socio-economic, sexual orientation with an emphasis on gender issues and gender stereotyping.
  
8. Gender Sensitivity
  - i) Explore gender and stereotyping issues in the workplace by identifying strategies for eliminating gender bias.

**Practical:**

1. Prepare an agenda.
2. Participate in a meeting.
3. Analyze a documented case of a human rights complaint with special emphasis on the application, time frame, documentation needed, and legal advice available.

## **SD-1710**

## **JOB SEARCH TECHNIQUES**

### **Description:**

This course is designed to give students an introduction to the critical elements of effective job search techniques.

### **Course Outcomes:**

Upon completion of this course, students will be able to:

- Demonstrate effective use of Job Search Techniques

### **Objectives & Content:**

1. Identify and examine employment trends and opportunities.
2. Identify sources that can lead to employment.
3. Access and review information on the Newfoundland and Labrador Apprenticeship and Certification Web site and the Apprenticeship Employment Gateway.
4. Analyze job ads and discuss the importance of fitting qualifications to job requirements.
5. Identify and discuss employability skills as outlined by the Conference Board of Canada.
6. Discuss the necessity of fully completing application forms.
7. Establish the aim/purpose of a resume.
8. Explore characteristics of effective resumes, types of resumes, and principles of resume format.
9. Explore characteristics of an effective cover letter.
10. Identify commonly asked questions in an interview.
11. Explore other employment related correspondence.
12. Explore the job market to identify employability skills expected by an employer.
13. Conduct a self-analysis and compare with general employer expectations.
14. Discuss the value of establishing and maintaining a portfolio.

**Practical:**

1. Complete sample application forms.
2. Write a resume.
3. Write an effective cover letter.
4. Establish a portfolio.
5. Write out answers to commonly asked questions asked during interviews.
6. Identify three potential employers from the Apprenticeship Employment gateway, Apprenticeship and Certification website.

## **SD-1720                      ENTREPRENEURIAL AWARENESS**

### **Description:**

This course is designed to introduce the student to the field of entrepreneurship, including the characteristics of the entrepreneur, the pros and cons of self-employment, and some of the steps involved in starting your own business.

### **Course Outcomes:**

Upon completion of this course, the student will be able to:

- Identify the various types of business ownership, the advantages and disadvantages of self-employment and identify the characteristics of an entrepreneur.
- State the purpose and identify the main elements of a business plan.

### **Objectives & Content:**

1. Explore Self-Employment: An Alternative to Employment.
  - i) Identify the advantages and disadvantages of self-employment vs. regular employment
  - ii) Differentiate between an entrepreneur and a small business owner
  - iii) Evaluate present ideas about being in business
2. Identify and discuss various types of business ownership.
  - i) Explore the Characteristic of Entrepreneurs
  - ii) Identify characteristics common to entrepreneurs
  - iii) Compare one's own personal characteristics with those of entrepreneurs.
  - iv) Examine one's present ideas about business people
3. Identify Business Opportunities.
  - i) Distinguish between an opportunity and an idea.
  - ii) Examine existing traditional and innovative business ventures
  - iii) Identify and summarize the role of various agencies that support business development.
  - iv) Identify potential business opportunities.
4. Review the Entrepreneurial Process.

- i) Explain the entrepreneurial process
- ii) Describe the purpose of a business plan
- iii) Identify & discuss the main elements of a business plan

**Practical:**

1. From a list of potential business opportunities prepare a list of elements that would have to be included in a business plan

## **APPENDIX A**

<b>Insulator (heat &amp; frost)</b> <b>Tool and Equipment List</b> <i>Required for Training Institutions</i>			
Category	Tool/Equipment Required	Number Required by Training Facility Per Class of 15	Required in Student Tool Kit
Hand Tools	Blow Torch (tiger torch)	1	
	Band Tightener	4	
	Banding Tools	2	
	Circumference Tape	2	
	Calculators	2	
	Caulking Gun	5	
	Chisel	15	
	Flare Staple Gun	2	
	Foam Gun	1	
	Hammer Chipping	8	
	Hammer Cross Pien	8	
	Hog Ringer	8	
	Knife (Long & Short)	8 each	Yes (1 long, 1 short)
	Lacing Hook/Needle	1	
	Miter Chart	6	
	Pliers (8" End Nipper)	6	Yes
	Pruning Saw	8	Yes
	*Punch	4 sets	Yes ( 1 set)
	Rivet Gun	8	
	Safety Shield	6	
	Scratch awl	8	Yes
	Scale Ruler	15	
	Scissors	8	Yes
	Scraping Tools	2 sets	
	Screwdriver (#2 Robison short and long)		Yes
	Shears (Aviation Shears M1 & M2)	8 each	Yes 1 each
	Shears Offset M6	4	
	Shovel	2	
	Springs & Bands	1 box ¾"	
	Staple Gun ( T50)	8	
	Tape Measure	2 - 25' & 50'	Yes 1 each
	Combination Square	8	
	Humidity/Temperature Meter	1	
	Thickness Gauge	8	
Tip Cleaner (spray equipment)	2		
*Trowels (float & Pointer)	4 each type	Yes 1 each	
Dividers (10 or 12 inch)	4	Yes	
Trammel points	2		
T-Square 4 ft.	2		

	Water Hoses	1		
	Wire Brush	8		
	Bull Snips (heavy & Light)	2 each		
<b>Power Tools</b>	Electric Drill 3/8"	4		
	Drills bits	2 sets		
	Electric Shears	1		
	Grinders	4		
	Pin Gun	1		
	Pneumatic Tools (rivet gun)	1		
	Power Actuated Tool	1		
	Skill Saw	1		
Shop Equipment	Lock Former	1		
	Roller	1		
	Airless Sprayer	1		
	Band Saw	1		
	Metal Shears Electric	1		
	HEPA Vacuum	1		
	Metal Brake 8 ft	1		
	Mixers	1		
	Negative Air Machine	1		
	Pump Sprayer	2		
	Sewing Machine	1		
	Shower (portable)	1		
	Stud Welder	1		
		Beader/Crimper	1	
<b>**Personal Protective Equipment</b>	Safety Boots		Yes	
	Hard Hat	2	Yes	
	Safety Glasses	2	Yes	
	Respirator	2	Yes	
	Gloves	2	Yes	

\* Required for Advanced Level only

\*\* Personal Protective Equipment must be provided by student