PROVINCIAL PLAN OF TRAINING
FOR THE
INSULATOR (HEAT & FROST) OCCUPATION

<table>
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<th>Document Status</th>
<th>Date Distributed</th>
<th>Mandatory Implementation Date</th>
<th>Comments</th>
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<tr>
<td>Approved – September 2007</td>
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<tr>
<td>Amended – October 2007</td>
<td></td>
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<td>Subject to PACB Approval</td>
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</table>
1. **Course Number used for Customer Service was an old number (MR 1200) – Updated number for Customer Service is MR 1220.**
PREFACE

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

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

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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____________________________________________________________________________
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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
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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

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

<table>
<thead>
<tr>
<th>5400 Hour Programs</th>
<th>Requirements for Progression</th>
<th>Progress To</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Apprentice</td>
<td>Completion of entry level (Block 1) courses, plus relevant work experience totaling a minimum of 1800 hours *</td>
<td>Second Year</td>
</tr>
<tr>
<td>Second Year Apprentice</td>
<td>Completion of advanced level (Block 2) courses, plus relevant work experience totaling a minimum of 3600 hours</td>
<td>Third Year</td>
</tr>
<tr>
<td>Third Year Apprentice</td>
<td>Completion of advanced level (Block 3) courses, plus sign-off of workplace skills required for certification totaling a minimum of 5400 hours</td>
<td>Write Certification Examination</td>
</tr>
</tbody>
</table>
**Insulator (Heat & Frost)**

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

* 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:

<table>
<thead>
<tr>
<th>Program Duration</th>
<th>Wage Rates</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>7200 Hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Year</td>
<td>55%</td>
<td></td>
</tr>
<tr>
<td>2nd Year</td>
<td>65%</td>
<td></td>
</tr>
<tr>
<td>3rd Year</td>
<td>75%</td>
<td></td>
</tr>
<tr>
<td>4th Year</td>
<td>90%</td>
<td>These wage rates are percentages of the prevailing journeyperson’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.</td>
</tr>
<tr>
<td>5400 Hours and 4800 Hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Year</td>
<td>55%</td>
<td></td>
</tr>
<tr>
<td>2nd Year</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>3rd Year</td>
<td>85%</td>
<td></td>
</tr>
<tr>
<td>4000 Hours</td>
<td></td>
<td>(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.</td>
</tr>
</tbody>
</table>
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 journeyperson.

▸ 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

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.

<table>
<thead>
<tr>
<th>NL Course No.</th>
<th>Course Name</th>
<th>Hours</th>
<th>Pre-Requisites</th>
<th>Page No.</th>
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<tr>
<td>TS-1510</td>
<td>Occupational Health and Safety</td>
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<td>TS-1520</td>
<td>WHIMIS</td>
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<td>None</td>
<td>19</td>
</tr>
<tr>
<td>TS-1530</td>
<td>First Aid</td>
<td>14</td>
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<td>22</td>
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<tr>
<td>HF-1100</td>
<td>Hand and Power Tools</td>
<td>6</td>
<td>None</td>
<td>23</td>
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<td>HF-1110</td>
<td>Shop Tools and Equipment</td>
<td>15</td>
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<td>25</td>
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<td>HF-1150</td>
<td>Insulation Principles</td>
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<td>HF-1200</td>
<td>Insulation Materials</td>
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<td>HF-1210</td>
<td>Insulation Practices</td>
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<td>Introduction to Pipe and Pipe Systems</td>
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<td>HF-1230</td>
<td>Installing Pipe Insulation</td>
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<td>HF-1200, HF-1210</td>
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<td>HF-1240</td>
<td>Hot Work Practices</td>
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<td>Introduction to Asbestos</td>
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<td>TS-1520</td>
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<td>Asbestos Removal Procedures</td>
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<td>HF-1250</td>
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<td>HF-1270</td>
<td>Blueprint Reading Part 1</td>
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<td>HF-1280</td>
<td>Introduction to Foam Insulation</td>
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<td>HF-1290</td>
<td>Installation of Flexible Foam Insulation</td>
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<td>HF-1280</td>
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<td>Air Handling System Components</td>
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<td>Blanket Insulation</td>
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<td>HF-1320</td>
<td>Fibrous Board Insulation</td>
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<td>HF-1330</td>
<td>Insulating Breeching, Flues and Precipitators</td>
<td>10</td>
<td>None</td>
<td>48</td>
</tr>
<tr>
<td>HF-1340</td>
<td>Insulating Methods (Cylinders and Heads)</td>
<td>30</td>
<td>None</td>
<td>49</td>
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<tr>
<td>HF-1350</td>
<td>Finishing Methods</td>
<td>15</td>
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<td>HF-1360</td>
<td>Introduction to Cryogenic Work</td>
<td>10</td>
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<tr>
<td>HF-1370</td>
<td>Insulating Cryogenic Systems</td>
<td>25</td>
<td>HF-1360</td>
<td>53</td>
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<tr>
<td>HF-1380</td>
<td>Insulate Underground Piping</td>
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<td>HF-1400</td>
<td>Parallel Line Development</td>
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<td>HF-1410</td>
<td>Radial Line Development</td>
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<td>HF-1420</td>
<td>Triangulation</td>
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<td>58</td>
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<td>HF-1500</td>
<td>Tees, Valves and Elbows</td>
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<tr>
<td>NL Course No.</td>
<td>Course Name</td>
<td>Hours</td>
<td>Pre-Requisites</td>
<td>Page No.</td>
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<td>HF-1510</td>
<td>Flanges and End Caps</td>
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<tr>
<td>HF-1520</td>
<td>Cones, Bevels and Transitions</td>
<td>25</td>
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<tr>
<td>HF-1540</td>
<td>Tank Heads</td>
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<td>HF-2270</td>
<td>Blueprint Reading –Part II</td>
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<td>HF-1270</td>
<td>65</td>
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<tr>
<td>HF-1550</td>
<td>Firestopping</td>
<td>25</td>
<td>None</td>
<td>67</td>
</tr>
<tr>
<td>*MA-1060</td>
<td>Basic Math</td>
<td>60</td>
<td>None</td>
<td>69</td>
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<tr>
<td>CM-2150</td>
<td>Workplace Communication</td>
<td>45</td>
<td>None</td>
<td>72</td>
</tr>
<tr>
<td>MR-1220</td>
<td>Customer Service</td>
<td>30</td>
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<td>74</td>
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<td>SP-2330</td>
<td>Quality Assurance/Quality Control</td>
<td>30</td>
<td>None</td>
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<td>MC-1050</td>
<td>Introduction to Computers</td>
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<td>None</td>
<td>78</td>
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<tr>
<td>SD-1700</td>
<td>Workplace Skills</td>
<td>30</td>
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<tr>
<td>SD-1710</td>
<td>Job Search Techniques</td>
<td>15</td>
<td>None</td>
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<td>SD-1720</td>
<td>Entrepreneurial Awareness</td>
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<td>86</td>
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<td>TOTAL:</td>
<td></td>
<td>930</td>
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The following tables outline the block structure for the Insulator (Heat and Frost) Program.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
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**Block 3 Total:** 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:

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
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.
   - hammers
   - screw drivers
   - pliers and wire cutters
   - levels
   - squares
   - measuring tools
   - clamps and temporary holding devices
   - saws
   - banding gear
   - sheet metal shears
   - Dividers
   - Knives

3. Describe the procedures to use and maintain various hand tools.

4. Identify common power tools.
   - drills and drill bits
   - saws
   - hand grinder
   - 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
Insulator (Heat & Frost)

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 us 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 environments.

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
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
Insulator (Heat & Frost)

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.
Insulator (Heat & Frost)

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 patterns 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 finished 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.
Insulator (Heat & Frost)

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


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

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
Insulator (Heat & Frost)

5. Create folders.
6. Maximize and minimize a window.
7. Describe windows task bar.

6. Describe Keyboards.
   i) Identify and locate alphabetic and numeric keys
   ii) Identify and locate function key & special keys

   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

   i) Saving a document
   ii) Closing a document
   iii) Starting a new document
   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

   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:**


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.

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.
   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.
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:

   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.

Insulator (Heat & Frost)

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
## Insulator (heat & frost) Tool and Equipment List

### Required for Training Institutions

<table>
<thead>
<tr>
<th>Category</th>
<th>Tool/Equipment Required</th>
<th>Number Required by Training Facility Per Class of 15</th>
<th>Required in Student Tool Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand Tools</td>
<td>Blow Torch (tiger torch)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Band Tightener</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Banding Tools</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Circumference Tape</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calculators</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Caulking Gun</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chisel</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flare Staple Gun</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Foam Gun</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hammer Chipping</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hammer Cross Pien</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hog Ringer</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Knife (Long &amp; Short)</td>
<td>8 each</td>
<td>Yes (1 long, 1 short)</td>
</tr>
<tr>
<td></td>
<td>Lacing Hook/Needle</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Miter Chart</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pliers (8” End Nipper)</td>
<td>6</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Pruning Saw</td>
<td>8</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>*Punch</td>
<td>4 sets</td>
<td>Yes (1 set)</td>
</tr>
<tr>
<td></td>
<td>Rivet Gun</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Safety Shield</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scratch awl</td>
<td>8</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Scale Ruler</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scissors</td>
<td>8</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Scraping Tools</td>
<td>2 sets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Screwdriver (#2 Robison short and long)</td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Shears (Aviation Shears M1 &amp; M2)</td>
<td>8 each</td>
<td>Yes 1 each</td>
</tr>
<tr>
<td></td>
<td>Shears Offset M6</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shovel</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Springs &amp; Bands</td>
<td>1 box ¾”</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Staple Gun (T50)</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tape Measure</td>
<td>2-25’ &amp; 50’</td>
<td>Yes 1 each</td>
</tr>
<tr>
<td></td>
<td>Combination Square</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Humidity/Temperature Meter</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thickness Gauge</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tip Cleaner (spray equipment)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Trowels (float &amp; Pointer)</td>
<td>4 each type</td>
<td>Yes 1 each</td>
</tr>
<tr>
<td></td>
<td>Dividers (10 or 12 inch)</td>
<td>4</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Trammel points</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T-Square 4 ft.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Tool Description</td>
<td>Quantity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>----------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Hoses</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wire Brush</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bull Snips (heavy &amp; Light)</td>
<td>2 each</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power Tools</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric Drill (3/8&quot;)</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drills bits</td>
<td>2 sets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric Shears</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grinders</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pin Gun</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumatic Tools (rivet gun)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Actuated Tool</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skill Saw</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Shop Equipment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lock Former</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roller</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Airless Sprayer</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Band Saw</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal Shears Electric</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HEPA Vacuum</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal Brake (8 ft)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixers</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Air Machine</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pump Sprayer</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sewing Machine</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shower (portable)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stud Welder</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beader/Crimper</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Personal Protective Equipment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety Boots</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard Hat</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety Glasses</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respirator</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gloves</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Required for Advanced Level only
** Personal Protective Equipment must be provided by student