



**PROVINCIAL PLAN OF TRAINING
FOR THE
IRONWORKER (GENERALIST)
OCCUPATION**

June 2003

Preface

This Provincial Plan of Training derived from the Atlantic Training Standard is based upon the 1993 edition of the National Occupational Analysis for the Ironworker (Generalist) trade. It was developed through the cooperative efforts of the Atlantic Apprenticeship Council, which consists of both the Atlantic Directors of Apprenticeship and Apprenticeship Board Chairs. This document describes the curriculum content for the Ironworker (Generalist) apprenticeship training program and outlines each of the courses necessary for completion of apprenticeship.

Acknowledgment

Advisory committees, industry representatives, instructors and apprenticeship staff provided valuable input into the development of this Provincial Plan of Training. Their dedication to quality apprenticeship will benefit institutional training for apprentices in this trade.

Apprenticeship Plan of Training Evaluation Form

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

- course 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 all feedback has been recorded, return this evaluation form along with the revised Plan of Training to the Apprenticeship Office noted at the bottom of the page.

(PLEASE PRINT)

Trade: Ironworker (Generalist)

Full Name: _____

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

Company: _____

Address: _____

Telephone: _____

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

Return Evaluation Form and Plan of Training to:

Manager, Industrial Training

Division of Institutional and Industrial Education

Department of Youth Services and Post-Secondary Education

P.O. Box 8700

St. John's, NF

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:

The completion of designated first year courses specific to the occupation
OR

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

OR

Enrolment in a program of studies that includes all entry and advanced level skills and required work experiences as approved by the Provincial Apprenticeship and Certification Board.

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

7200 Hour Programs	Requirements for Progression	Progress To
First Year Apprentice	25% of Course Credit Hours, Plus relevant work experience totaling 1800 hours	Second Year
Second Year Apprentice	50% of Course Credit Hours, Plus relevant work experience totaling 3600 hours	Third Year
Third Year Apprentice	75% of Course Credit Hours, Plus relevant work experience totaling 5400 hours	Fourth Year
Fourth Year Apprentice	100% of Course Credit Hours, Plus completion and sign-off of workplace skills required for certification totaling 7200 hours	Write Certification Examination
5400 Hour Programs	Requirements for Progression	Progress To
First Year Apprentice	33% of Course Credit Hours, Plus relevant work experience totaling 1800 hours	Second Year
Second Year Apprentice	66% of Course Credit Hours, Plus relevant work experience totaling 3600 hours	Third Year
Third Year Apprentice	100% of Course Credit Hours, Plus completion and sign-off of workplace skills required for certification totaling 5400 hours	Write Certification Examination

4800 Hour Programs	Requirements for Progression	Progress To
First Year Apprentice	33% of Course Credit Hours, Plus relevant work experience totaling 1600 hours	Second Year
Second Year Apprentice	66% of Course Credit Hours, Plus relevant work experience totaling 3200 hours	Third Year
Third Year Apprentice	100% of Course Credit Hours, Plus completion and sign-off of workplace skills required for certification totaling 4800 hours	Write Certification Examination

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

Program Duration	Wage Rates		Comments
7200 Hours	1 st Year	55%	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.
	2 nd Year	65%	
	3 rd Year	75%	
	4 th Year	90%	
5400 Hours and 4800 Hours	1 st Year	55%	
	2 nd Year	70%	
	3 rd Year	85%	
4000 (Hairstylist) - The apprentice shall be paid no less than the minimum wage for hours worked and a commission agreed upon between the apprentice and the employer.			

6.0 TOOLS

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

7.0 PERIODIC EXAMINATIONS AND EVALUATION

7.1 Every apprentice shall submit to such occupational tests and examinations as the Board shall direct. If after such occupational tests and examinations the apprentice is found to be making unsatisfactory progress, his/her rate of wage shall not be advanced as provided in

Section 5 until his/her progress is satisfactory to the Director of Institutional and Industrial Education and his/her date of completion shall be deferred accordingly. Persistent failure to pass required tests shall be a cause for revocation of his/her Memorandum of Understanding.

- 7.2 Upon receipt of reports of accelerated progress of the apprentice, the Board may shorten the term of apprenticeship and advance the date of completion accordingly.
- 7.3 For each and every course, a formal assessment is required for which 70% is the pass mark. At the discretion of the instructor, the summative mark may be for completion of a theory examination or a combination of the theory examination and an assigned practical project.

8.0 GRANTING OF CERTIFICATES OF APPRENTICESHIP

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

9.0 HOURS OF WORK

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

10.0 COPIES OF THE REGISTRATION FOR APPRENTICESHIP

The Director of Institutional and Industrial Education shall provide copies of the Registration for Apprenticeship form to all signatories to the document.

11.0 RATIO OF APPRENTICES TO JOURNEYPERSONS

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

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

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

13.0 AMENDMENTS TO A PLAN OF APPRENTICESHIP TRAINING

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

14.0 EMPLOYMENT, RE-EMPLOYMENT AND TRAINING REQUIREMENTS

- 14.1 The plan of training requires Apprentices to attend regularly their place of employment.
- 14.2 The plan of training requires Apprentices to regularly attend training programs for that occupation as prescribed by The Provincial Apprenticeship and Certification Board.
- 14.3 Failure to comply with Sections 14.1 and/or 14.2 will result in cancellation of the Memorandum of Understanding. Apprentices may have their M.O.U.'s reinstated by the Provincial Apprenticeship and Certification Board but would be subject to a commitment to complete the entire program as outlined in the General Conditions of Apprenticeship. Permanent cancellation in the said occupation is the result of non-compliance.
- 14.4 Cancellation of the Memorandum of Understanding to challenge journeyperson examinations, if unsuccessful, would require an apprentice to serve a time penalty of two (2) years before reinstatement as an apprentice or registering as a Trade Qualifier.
- 14.5 Under the plan of training the employer is required; to keep each apprentice employed as long as work is available, and if the apprentice is laid off due to lack of work, to give opportunity to be re-employed before another is hired.
- 14.6 The employer will permit each apprentice to attend regularly training programs as prescribed by the Provincial Apprenticeship and Certification Board.
- 14.7 Apprentices who cannot acquire all the workplace skills at their place of employment will have to be evaluated in a simulated work environment at a training institution and have sign-off done by instructors to meet the requirements for certification.

15.0 APPEALS TO DECISIONS BASED ON CONDITIONS GOVERNING APPRENTICESHIP TRAINING

Persons wishing to appeal any decisions based on the above conditions must do so in writing to the Minister of Youth Services and Post-Secondary Education within 30 days of the decision.

REQUIREMENTS FOR RED SEAL CERTIFICATION

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. Normally, a combination of training from an accredited training program and suitable work experience totalling 7200 hours

Or

A total of 9000 hours of suitable work experience.

3. Completion of a National Red Seal examination, to be set at a place and time determined by the Industrial Training Division.
4. 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.

Program Outcomes

Upon successful completion of the Ironworker (Generalist) Program, apprentices will have the knowledge and skills required to perform the following tasks:

- Task 1 Practices safety and maintains a safe work environment.
- Task 2 Plan jobs in accordance with drawings, work site requirements and specifications.
- Task 3 Coordinates delivery and installation of materials and equipment as job progresses.
- Task 4 Prepare wire, fibre rope and tackle.
- Task 5 Rig and move loads.
- Task 6 Assemble, erect, jump and dismantle tower cranes.
- Task 7 Assemble, erect, jump and dismantle various derrick types.
- Task 8 Assemble and dismantle conventional and hydraulic cranes.
- Task 9 Assemble, erect, jump and dismantle material and personnel hoists.
- Task 10 Install support structures, framework and related structural and mechanical equipment for conveying systems and material handling systems.
- Task 11 Erects structural steel for buildings, bridges and towers.
- Task 12 Erect metal, bins and hoppers.
- Task 13 Assembles and erect pre-engineered buildings.
- Task 14 Assemble and install curtain walls, window walls, doorways, store fronts, revolving doors, mantraps, etc., in and on all buildings.
- Task 15 Install ornamental and miscellaneous ironwork and nonferrous components, such as stairways, railings, panels, catwalks, fences, sound barriers, vehicle guardrails, etc.
- Task 16 Erect structural and architectural precast concrete components for buildings, bridges, towers and other structures.
- Task 17 Inspect of test structures and equipment for deterioration, defects, non-compliance with specifications or regulations, and unsafe conditions during of after construction.
- Task 18 Dismantle building framework, bridges, tanks, silos or other structures made of metal, precast concrete and laminated timbers.
- Task 19 Position and secure steel bar of wire mesh reinforcing in forms prior to the pouring of concrete for grade beams, footings, walls, floors, columns, caissons and other components.
- Task 20 Post-tension tendon steel cables or rods in cast-in-place or precast concrete for reinforcement purposes.
- Task 21 Erect and install robotic equipment for material handling and automated mechanical systems.
- Task 22 Erect temporary frame of tube scaffolds, false work, shoring, etc.
- Task 23 Suspend scaffolds from structures.
- Task 24 Erect structural wood material for buildings such as, mine product storage, churches, schools, pedestrian bridges and walkways.

PROGRAM STRUCTURE

NF Course No.	Atlantic Course No.	Course Name	Suggested Hours	Prerequisites	Page No.
TS-1510		Occupational Health & Safety	6		12
TS-1530		First Aid	14		15
TS-1520		WHMIS	6		16
RK-1100	IRW-0100	Safety	30		19
RK-1110	IRW-1105	Tools and Equipment	60	IRW-0100	21
RK-1120	IRW-0110	Blueprint Reading 1 (Principles)	30		23
RK-1130	IRW-1115	Blueprint Reading 2 (Structural)	60	IRW-0110	24
RK-1140	IRW-1120	Blueprint Reading 3 (Rebar)	45	IRW-1110	25
RK-1150	IRW-1125	Oxy-fuel and Plasma Arc Cutting	45	IRW-1105	26
RK-1160	IRW-1130	Electric Arc Welding and Arc Air Gouging	90	IRW-1105	28
RK-1170	IRW-1135	Rigging 1 (Hardware)	30	IRW-1105	30
RK-1180	IRW-1140	Rigging 2 (Procedures)	30	IRW-1135	33
RK-1190	IRW-1145	Rigging 3 (Load Handling)	30	IRW-1140	35
RK-1200	IRW-1150	Conventional and Hydraulic Cranes	60	IRW-1145	37
RK-1210	IRW-1225	Decking and Grating	30	IRW-1115, 1135, 1160	39
RK-2100	IRW-1155	Structural Steel 1 (Preparation)	30	IRW-1105, 1115, 1150, 1180	40
RK-2110	IRW-1160	Structural Steel 2 (Erection)	120	IRW-1155	41
RK-2120	IRW-1165	Structural Steel 3 (Plumbing and Securing)	60	IRW-1160, 1245	43
RK-2240	IRW-1170	Storage Tanks, Bins and Hoppers	30	IRW-0110, 1150, 1245	45
RK-2250	IRW-1175	Pre-Engineered Buildings	30	IRW-0110, 1150, 1245	47
RK-2130	IRW-1180	Job Planning, Coordination and Site Preparation	60	IRW-1105, 0110, 1150	49
RK-2140	IRW-1185	Dismantling	60	IRW-1115, 1150, 1165	52
RK-2150	IRW-1190	Post-tensioning	45	IRW-1120, 1140	54
RK-2160	IRW-1195	Robotic Equipment	15	IRW-0110, 1150	56
RK-2260	IRW-1200	Wooden Structures	15	IRW-0110, 1150, 1245	57

NF Course No.	Atlantic Course No.	Course Name	Suggested Hours	Prerequisites	Page No.
RK-2170	IRW-1205	Ornamental and Miscellaneous Ironwork	120	IRW-1115, 1150, 1125, 1130	58
RK-2180	IRW-1210	Pre-cast Concrete	30	IRW-1150, 1215, 1130	60
RK-2190	IRW-1215	Tower Cranes	30	IRW-1150	62
RK-2200	IRW-1220	Derricks and Electric Overhead Travelling (EOT) Cranes	30	IRW- 1150	64
RK-2210	IRW-1230	Reinforced Concrete 1 (Principles)	60	IRW-0120, 1145, 1180	66
RK-2220	IRW-1235	Reinforced Concrete 2 (Pre-assembly and Installation)	60	IRW-1150, 1230, 1120	67
RK-2270	IRW-1240	Reinforced Concrete 3 (Fabrication)	60	IRW-1120, 1150, 1245	69
RK-2230	IRW-1245	Temporary Access Structures and Working Platforms	60	IRW-1105, 0110, 1140	71
RK-2280	IRW-1250	Falsework	30	IRW-1115, 1150, 1245	73
RK-2290	IRW-1255	Curtain Walls	60	IRW-1115, 1150, 1215, 1220	74
CM-2150		Workplace Correspondence	45		76
MR-1220		Customer Service	30		78
SP-2330		Quality Assurance/Quality Control	30		80
MC-1050		Introduction to Computers	30		82
SD-1700		Workplace Skills	30		87
SD-1710		Job Search Techniques	15		89
SD-1720		Entrepreneurial Awareness	15		90

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
 - a. 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
 - Duties of employer, owner, contractors, sub-contractors, employees, and suppliers
3. Explain the purpose of joint health and safety committees
 - Formation of committee
 - Functions of committee
 - Legislated rights
 - Health and safety representation
 - Reporting endangerment to health
 - Appropriate remedial action
 - Investigation of endangerment
 - Committee recommendation
 - Employer's responsibility in taking remedial action
4. Examine right to refuse dangerous work
 - Reasonable grounds for refusal
 - Reporting endangerment to health

- Appropriate remedial action
- Investigation of endangerment
- Committee recommendation
- Employer's responsibility to take appropriate remedial action
- Action taken when employee does not have reasonable grounds for refusing dangerous work
- Employee's rights
- Assigning another employee to perform duties
- Temporary reassignment of employee to perform other duties
- Collective agreement influences
- Wages and benefits

5. Describe discriminatory action

- Definition
- Filing a complaint procedure
- Allocated period of time a complaint can be filed with the Commission
- Duties of an arbitrator under the Industrial Relations Act
- Order in writing inclusion
- Report to commission Allocated period of time to request Arbitrator to deal with the matter of the request
- Notice of application
- Failure to comply with the terms of an order
- Order filed in the court

6. Explain duties of commission officers

- Powers and duties of officers
- Procedure for examinations and inspections
- Orders given by officers orally or in writing
- Specifications of an order given by an officer to owner of the place of employment, employer, contractor, sub-contractor, employee, or supplier
- Service of an order
- Prohibition of persons towards an officer in the exercise of his/her power or duties
- Rescinding of an order
- Posting a copy of the order
- Illegal removal of an order

7. Interpret appeals of others

- Allocated period of time for appeal of an order
- Person who may appeal order
- Action taken by Commission when person involved does not comply with the order
- Enforcement of the order
- Notice of application
- Rules of court

8. Explain the process for reporting of accidents

- Application of act
- Report procedure
- Reporting notification of injury
- Reporting accidental explosion or exposure
- Posting of act and regulations

Practical:

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

1. Describe work situations that one might want to refuse.
2. Interview someone in your occupation on two or more aspects of the act and report results.

TS1530

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** Standard First Aid Certificate course.

TS 1520

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

Description:

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

Course Outcomes:

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

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

Required Knowledge and Skills:

1. Define WHMIS safety
 - Rational and key elements
 - History and development of WHMIS
 - WHMIS legislation
 - WHMIS implementation program
 - Definitions of legal and technical terms
2. Examine hazard identification and ingredient disclosure
 - Prohibited, restricted and controlled products
 - Classification and the application of WHMIS information requirements
 - 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
 - Products excluded from the application of WHMIS legislation
 - consumer products
 - explosives
 - cosmetics, drugs, foods and devices
 - pest control products
 - radioactive prescribed substances

- wood or products made of wood
- manufactured articles
- tobacco or products of tobacco
- hazardous wastes
- products handled or transported pursuant to the Transportation of Dangerous Goods (TDG) Act
- Comparison of classification systems - WHMIS and TDG
- General comparison of classification categories
- Detailed comparison of classified criteria

3. Explain labeling and other forms of warning

- Definition of a WHMIS label
 - supplier label
 - workplace label
 - other means of identification
- Responsibility for labels
 - supplier responsibility
 - employer responsibility
 - worker responsibility
- Introduce label content, design and location
 - supplier labels
 - workplace labels
 - other means of identification

4. Introduce material safety data sheets (MSDS)

- Definition of a material safety data sheet
- Purpose of the data sheet
- 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 below are **mandatory** in Newfoundland, 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

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis task 1.

Course Outcomes:

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

- practice safety and maintain a safe work environment.

Theory:**PERSONAL PROTECTIVE EQUIPMENT**

1. Identify types of personal protective equipment and describe their purpose and use.
 - hearing protection
 - dust mask
 - respirator
 - safety glasses
 - protective clothing
 - guards and shields
2. Identify types of equipment used for working at heights and describe their safe use and maintenance.
 - fall arrest systems
 - safety nets
 - safety ropes
 - life lines
 - lanyards
 - anchor points
3. Describe the procedures used to install, maintain and inspect fall protection systems.

SAFETY REGULATIONS

4. Identify relevant safety regulations and describe their application to the Ironworker (Generalist) trade.
 - federal
 - WHMIS
 - provincial
 - Workers Compensation Board
 - code of practice
 - industry standards
 - municipal

WORKPLACE SAFETY

5. Describe potential work hazards on-site.
6. Describe employer/employee responsibilities for workplace safety.
7. Describe the safety requirements for working in confined spaces.
8. Describe safety practices when working in or near trenches and excavations.
9. Describe the purpose of lockout/tag-out procedures and their application to the work site.
10. Define the term proximity work and describe its associated safety procedures.
 - barriers and barricades
 - adjacent perimeter areas
 - public safety
11. Identify types of ladders and scaffolding and describe their applications, use and inspection procedures.

FIRE SAFETY

12. Identify the classes of fires and their associated fire extinguishers.
13. Identify various flammable materials and describe the precautions to be taken to prevent combustion.

Practical:

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

1. Theory only.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis task 1.

Course Outcomes:

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

- demonstrate knowledge of hand tools, their use and care.
- demonstrate knowledge of power tools, their use and care.
- demonstrate knowledge of the ironworker machine, its operating principles and procedures for use and care.

Theory:

1. Identify types of hand tools and describe their characteristics, applications, use and care.
 - wrenches and sockets
 - cutting
 - screwdrivers
 - pliers
 - hammers
 - clamping
 - grinding and sharpening
 - bending
 - measurement, layout and alignment
 - lifting
 - plumbing and levelling
 - prying and dismantling
 - punching, boring and drilling
 - securing and assembling
2. Identify portable and stationary power tools and describe their characteristics, applications, safe use and care.
 - compressors and generators
 - grinders
 - hydraulic jacks and pumps
 - benders
 - pneumatic and electric
 - impact
 - reamers
 - rivet gun
 - magnetic drills
3. Describe drilling procedures.
 - sizing

- sharpening
- centre punching
- speed and feed rates
- selection of cutting fluids
- countersinking
- selection of accessories

4. Identify types of levelling and alignment instruments and describe their purpose and procedures for use.
 - transit level
 - laser level
 - optical level
5. Describe the ironworker machine, its components, operating principles, applications and procedures for use.

Practical:

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

1. Cope and heat-bend angle-iron.
2. Lay out framework.
3. Select and use hand tools.
4. Select and use power tools.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis task 2.

Course Outcomes:

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

- demonstrate knowledge of the conventions and basic operations associated with blueprints and drawings used in construction.

Theory:

1. Describe the functions of blueprints and drawings and their use.
2. Describe the various types of plans and drawings.
3. Identify and interpret the lines and symbols used on prints.
4. Describe the procedures used to construct an isometric, orthographic and multi-view drawing.
5. Describe the procedures used to take dimensions using:
 - architects' scale rule
 - mathematical calculations from construction blueprints
6. Describe the purpose and use of specifications for blueprints and drawings.

Practical:

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

1. Construct an isometric, orthographic and multi-view drawing.
2. Take dimensions using:
 - architects' scale rule
 - mathematical calculations from construction blueprints

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis task 2.

Course Outcomes:

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

- demonstrate knowledge of structural drawings and their use.

Theory:

1. Describe the component parts of steel structures.
2. Define the terminology related to the materials and processes used.
3. Identify basic structural materials and shapes.
4. Identify and interpret the symbols used on blueprints for steel structures.
5. Describe the procedures used to compile a materials take-off.

Practical:

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

1. Verify fabricated structural steel for layout prior to erection.
2. Verify anchor bolt layout.
3. Compile a materials take-off.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis task 2.

Course Outcomes:

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

- demonstrate knowledge of rebar drawings and their use.

Theory:

1. Define the terminology and symbols related to the materials and processes used with reinforcing steel.
2. List the component parts of reinforced concrete and identify their associated symbols and abbreviations.
3. Identify basic reinforced materials and shapes.
4. Describe the procedures used to compile a materials take-off for reinforcing steel.

Practical:

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

1. Compile a materials take-off.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis throughout the document.

Course Outcomes:

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

- demonstrate knowledge of oxy-fuel cutting equipment and procedures for their use and care.
- demonstrate knowledge of plasma arc cutting equipment and procedures for their use and care.

Theory:

1. Define terminology associated with cutting.
2. Describe safety practices for use in cutting operations.
 - clothing
 - location
3. Describe the purpose, principles and applications of oxy-fuel/plasma arc cutting.
4. Identify the material, tools and equipment used in oxy-fuel/plasma arc cutting.
5. Identify metals that can be cut using oxy-fuel/plasma arc cutting equipment.
6. Describe the various styles and designs of standard cutting torches.
7. Identify the various cutting tips and describe their care and maintenance.
 - sizes and styles
 - indexing
 - accessories
 - tip cleaners
8. Describe the various types of cutting flames and procedures used for flame adjustment.
 - oxidizing
 - carburizing
 - neutral
9. Describe work processes and sequences associated with oxy-fuel/plasma arc cutting.
10. Describe oxy-fuel cutting techniques.

11. Describe oxy-fuel/plasma arc cutting procedures.
 - free hand
 - straight edge
 - track cutting
12. Identify common cutting faults and describe their causes and remedies.

Practical:

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

1. Set up cutting equipment.
2. Perform free hand, track and straight edge oxy-fuel cutting.
3. Perform free hand and straight edge plasma arc cutting.
4. Shut down and disassemble cutting equipment.

IRW-1130 Electric Arc Welding and Arc Air Gouging

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis throughout the document.

Course Outcomes:

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

- demonstrate knowledge of electric arc welding and arc air gouging equipment and procedures for their use.
- set up equipment and weld using the FCAW process.
- set up equipment and weld using the SMAW process.

Theory:

1. Describe basic electrical welding principles.
2. Identify equipment used in welding processes and describe its use.
 - FCAW
 - SMAW
 - gouging
 - stud welding
3. Describe machine controls and settings.
4. Describe consumables, their characteristics, classifications, applications, care and use.
5. Describe the various types of welds and basic joints.
6. Identify welding symbols and describe their use.
7. Identify types of weld faults and describe their causes and remedies.
8. Describe the procedures used to weld.
 - FCAW
 - SMAW
 - arc air gouging
 - stud welding

Practical:

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

1. Set up equipment and perform a plate weld using the SMAW process.
2. Set up equipment and perform a plate weld using the FCAW process.
3. Set up equipment and perform arc air gouging.
4. Set up equipment and perform stud welding.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis task 4.

Course Outcomes:

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

- select and inspect, use and care for synthetic, wire rope, fibre rope and chain slings.
- select and inspect, use and care for hoist ropes and tackle.

Theory:

1. Identify hand signals and describe their purpose and applications.

FIBRE ROPES

2. Identify the types of fibre ropes and describe their parts, characteristics and applications.
 - breaking strengths
 - working load limits (WLL)
 - measuring
 - knots
 - bends
 - hitches
3. Describe the procedures used to make various splices in fibre ropes.
4. Identify the various types of end connections used with fibre ropes and describe their characteristics and applications.
5. Describe the procedures used to inspect fibre ropes.
 - identify deterioration
 - criteria for removal from service
6. Describe the method to measure and cut fibre rope.

WIRE ROPES

7. Identify the types of wire ropes and describe their parts, characteristics and applications.
 - composition
 - lays
 - classification system
 - core types

- measurement
- breaking strengths
- working load limits (WLL)

8. Describe the procedures used to make various splices in wire rope.
9. Identify the types of cable clips and describe their characteristics, applications and procedures for installation.
 - spacing clips
 - safety factors
10. Identify the types of turnbuckles and describe their characteristics, applications and procedures for use.
11. Describe the procedure used to inspect wire rope.
 - identify deterioration
 - criteria for removal from service
12. Describe the method used to measure and cut wire rope.

SLINGS

13. Describe the various configurations of slings, their applications and working load limits.
 - single vertical hitch
 - basket hitch
 - bridle hitch
 - choker hitch
14. Identify basic types of chain slings and describe their characteristics, applications and procedures for use.
 - safety precautions
 - grades of steel
 - working load limit
15. Describe the procedures used to inspect slings.
 - identify deterioration
 - criteria for removal from service

Practical:

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

1. Rig materials using basic equipment and techniques.
2. Demonstrate placement and use of slings.
3. Inspect, measure and cut wire and fibre ropes.
4. Inspect rigging equipment.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 4 and 5.

Course Outcomes:

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

- demonstrate knowledge of the criteria and calculations necessary to select and plan rigging equipment and methods.
- demonstrate knowledge of rigging procedures and their use.

Theory:

1. Review hand signals and describe their purpose and applications.
2. Describe the procedures used to calculate appropriate formulae relating to rigging equipment.
 - weight estimations
 - wire rope clips
 - drum capacities
 - hooks
 - shackles
 - sheaves
 - spreader and equalizer beams
3. Describe reeving and lacing, their purpose and associated procedures used.
 - advantages and disadvantages
 - friction
 - mechanical advantage
 - efficiencies
 - applications
4. Describe the procedures for using temporary lashing.
 - working load limits (WLL)
 - clips
 - turnbuckles
 - shackles
5. Describe the procedures used to fabricate and install guy wires.
 - working load limits (WLL)
 - breaking strength
 - clip spacing
 - thimble size
 - turnbuckle

Practical:

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

1. Estimate weight of loads and working load limits (WLL).
2. Perform reeving and lacing of blocks.
3. Select and install turnbuckles, thimbles and cable clips.
4. Assemble and operate block and tackle.
5. Perform temporary lashing of load.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis task 5.

Course Outcomes:

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

- demonstrate knowledge of hoisting and conveyancing equipment, their components, applications and procedures for use.
- rig and move loads.

Theory:**MOVING AND HOISTING EQUIPMENT**

1. Identify various types of moving and hoisting equipment and describe their applications and procedures for use.
 - come-alongs
 - grip action hoist (tirfors)
 - chain block hoist
 - hydraulic jacks
 - fork lift
 - stringers
 - rollers
 - bents
 - dunnage (hardwood blocking)
 - tuggers
 - winches
 - beam trolleys
2. Describe the procedures used to identify the center of gravity of a load.

PLACEMENT OF LOADS

3. Describe the procedures used to determine and plan placement of loads.
 - drawings
 - precautions
 - storage

SIGNALLING

4. Describe the purpose and applications of signalling.
5. Identify crane signals and describe their meaning and procedures for use.
 - raising loads

- moving loads
- lowering loads

Practical:

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

1. Plan and execute a mock lift.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 7, 8 and 17.

Course Outcomes:

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

- demonstrate knowledge of crane assembly and disassembly.
- demonstrate knowledge of load rigging and lifting procedures using cranes.

Theory:**PRINCIPLES OF LEVERAGE**

1. Describe the basic principles of leverage associated with cranes.

ASSEMBLY

2. Identify the common types of crane equipment and describe their characteristics and applications.
 - hydraulic
 - conventional
 - crawler
 - carrier mounted
 - rough terrain
 - high capacity
 - ringer
 - sky horse
3. Describe the procedures used to prepare a site for crane assembly.
 - off-loading inventory
 - required equipment
 - crane components and layout
4. Describe crane erection sequence.
 - boom/jib assembly
 - counterweight
 - reeving
5. Describe the procedure used to level and plumb crane and set outriggers.
 - conventional cranes
 - crawlers
 - carriers
 - hydraulic cranes

RIGGING AND LOAD HANDLING

6. Describe the use of calculations, tables and charts to lift and move loads.
7. Describe the procedures used to attach headache ball to the whip line.

INSPECTION AND DISASSEMBLY

8. Describe the procedure used to perform visual inspection of crane components.
 - conventional cranes
 - hydraulic cranes
9. Describe the procedures used to dismantle cranes.

Practical:

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

1. Theory only.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis task 15.

Course Outcomes:

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

- demonstrate knowledge of decking and grating, its components and installation.

Theory:

1. Define terminology associated with decking and grating.
2. Describe the components of decking and grating.
3. Identify types of tools and equipment required to install decking and grating.
4. Identify types of fasteners used in decking and grating.
5. Describe procedures used to interpret blueprints for decking and grating.
6. Describe procedures used to install decking and grating.
7. Describe placement of bundles of decking and grating.
 - safety
 - installation

Practical:

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

1. Theory only.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 11 and 17.

Course Outcomes:

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

- demonstrate knowledge of structural steel members, their identification and handling.

Theory:

1. Define terminology associated with steel erection.
2. Identify the types of steel structures and describe their components.
 - buildings
 - bridges
 - towers
3. Describe the safety guidelines for erecting structural steel.
 - industry standards
 - codes of practice
 - government regulations
4. Describe the tools and equipment required to erect structural steel.
5. Describe the procedures used to receive, verify, sort and store structural steel members.

Practical:

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

1. Theory only.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 11 and 17.

Course Outcomes:

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

- demonstrate knowledge of erecting and securing structural steel.

Theory:

1. Describe the procedures used for material movement and storage in a safe and orderly manner.
 - use of crane
 - rigging
 - hooking on
 - placement
 - planning of access and temporary structures
2. Describe the procedures used to accept and secure structural members into position.
 - use of cranes
 - use of drawings
 - layout of structural members prior to erection
 - bracing
 - fastening
 - selection of tools
 - climbing with fall arrest systems
 - shims
3. Identify tools and fasteners used to align components and describe their installation according to specifications.
 - pins
 - bolts
 - reamers
 - hammers
4. Describe the procedures used to weld structures according to specifications.
5. Describe the procedures used to inspect structural steel after erection according to standards.
 - visual
 - mechanical

Practical:

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

1. Develop a work site plan.
2. Erect and secure structural steel members.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 11 and 17.

Course Outcomes:

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

- demonstrate knowledge of plumbing and securing steel structures.
- test and inspect steel structures.

Theory:

1. Identify the tools used to plumb up and align structures and describe their procedures for use.
 - plumb bob
 - transit
 - level
 - turnbuckles
 - guy lines
2. Identify tools used for impacting and describe their applications and procedures for use.
 - impact wrenches
 - pneumatic
 - electric
 - torque wrenches
 - reamers
3. Describe the procedures used to remove temporary bracing.
4. Describe the procedures used to test and inspect structural steel after erection according to standards.
 - visual
 - mechanical

Practical:

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

1. Develop a work site plan.
2. Plumb, align and secure steel structures.
3. Test and inspect steel structures.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 12 and 17.

Course Outcomes:

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

- demonstrate knowledge of assembly and erection of storage tanks, bins and hoppers.

Theory:

1. Identify tools and equipment and describe their applications.
 - key plates
 - pins
 - strong backs
 - dogs
 - wedges
2. Describe preparation and planning for erection and assembly.
 - receiving, identifying and sorting components
3. Describe the procedures used to prepare components for assembly and erection.
 - welding and cutting
 - grinding
 - joint preparation
 - gouging
4. Describe the procedures used to erect and assemble components.
 - interpret specifications
 - bolting and welding
 - scaffolding
 - rigging
 - hoisting
 - placement
 - temporary fastening
 - aligning and levelling
5. Identify the types of sealants used for storage tanks, bins and hoppers and describe the methods used to seal joints.
6. Describe the different methods used to test and inspect structures and joints.
7. Describe the procedures used to repair and finish surfaces.

Practical:

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

1. Theory only.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 13 and 17.

Course Outcomes:

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

- demonstrate knowledge of planning, pre-assembly and erection of pre-engineered structures.

Theory:**PREPARATION**

1. Define terminology associated with pre-engineered structures.
2. Identify types of pre-engineered structures and describe their components, characteristics and applications.
3. Describe the procedures used to plan and prepare for erection of pre-engineered structures.
 - selection of tools and equipment
 - identification, receiving and storage of components
 - bills of lading
 - materials list
 - manufacturer's handling specifications
 - movement of materials
 - rigging
 - placement

ERCTION

4. Describe the procedures used to install pre-engineered structures as per manufacturers' specifications.
 - roofing
 - cladding
 - insulation
 - doors
 - personnel
 - roll-up
 - windows
 - panels

Practical:

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

1. Theory only.

IRW-1180 **Job Planning, Coordination and Site Preparation**

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 2 and 3.

Course Outcomes:

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

- demonstrate knowledge of planning requirements and procedures.
- demonstrate knowledge of job-site preparation and coordination of tasks.

Theory:

PRELIMINARIES

1. Define terminology associated with job-site preparation.
2. Describe procedures used to prepare work site.
 - interpretation of plan drawings
 - site drawings
 - fabrication drawings
 - detail drawings
 - erection drawings
 - field sketches
3. Describe the set up and procedures for use of site instruments.
 - transit level
 - optical level
 - level
 - laser leveling devices
 - plumb bob
 - chalk line
 - piano wire
 - square
4. Describe site-specific hazards, precautions and safe practices.
5. Describe the procedures used to identify lay-down areas.
 - prefab site
 - obstructions
6. Describe the procedure used to lay-out grid lines.
7. Describe the procedure used to check existing grid lines.
8. Describe relevant federal, provincial and local standards, codes and regulations.

MATERIALS

9. Describe inventory procedures.
10. Describe material lists, their purpose and use.
11. Describe the procedures used to coordinate delivery of materials to the job site.

JOB SITE PREPARATION

12. Describe the procedures used to prepare job site for storage of material and equipment.
13. Describe the procedures used to off-load steel members and other construction materials.
14. Describe procedures used to check symbols or marks to sort steel members and other construction materials.
15. Describe the procedures used for material movement and storage in a safe and orderly manner after delivery.
 - use of crane
 - rigging
 - hooking on to structural member
 - placement
 - load management
16. Describe the procedures to visually inspect job site.

EQUIPMENT

17. Describe the procedures used to receive, move and position equipment.
18. Describe selection and installation procedures for various types of equipment.
19. Describe the erection planning procedures.
 - structural steel buildings
 - bridges steel and concrete
 - cranes and derricks
20. Describe the procedures used to develop and adjust construction schedules.

PERSONNEL

21. Describe the procedures used to determine manpower requirements for job site.

22. Describe the importance of site roles and communication.
 - ironworker responsibilities
 - coordination of work with other trades

REPORTS

23. Describe reports, their purpose and use.
 - interim
 - check list
 - Non-Conformance Reports (NCR)
 - Mill test specifications

Practical:

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

1. Set up and use site equipment.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis task 18.

Course Outcomes:

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

- demonstrate knowledge of planning requirements for demolition.
- demonstrate knowledge of equipment and procedures used in demolition.
- demonstrate knowledge of material storage and disposal.

Theory:

1. Identify the tools and equipment required for demolition and describe their use.
2. Describe the procedures to have utilities disconnected.
 - gas
 - electricity
3. Describe the procedures used to handle steel members and other construction materials.
 - identification and sorting
 - match marking
4. Describe the procedures used to dismantle miscellaneous structural components.
 - use of drawings
 - planning of sequence
 - disconnection
5. Describe the procedures used to move materials.
 - selection of equipment
 - weight calculation
 - rigging
 - lifting strain
6. Describe the procedures used to dispose of material.
 - preparing material for shipment
 - storage of material

Practical:

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

1. Develop a work site plan.
2. Dismantle structural steel.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis task 20.

Course Outcomes:

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

- demonstrate knowledge of post-tensioning tendons in cast-in place and pre-cast concrete.
- demonstrate knowledge of inspection and testing of post-tensioned structures.

Theory:**PREPARATION**

1. Identify the tools and equipment required for post-tension work and describe their use.
2. Describe the procedures used to prepare for post-tension work.
 - site layout and preparation
 - notifications
 - use of drawings
 - pre-stress
 - fabrication drawings

PROCEDURES

3. Describe the procedures used to verify and mark tendon locations on concrete forms.
4. Describe the procedures used to verify correct locations of holes in forms for anchoring systems.
5. Describe the procedures used to position and secure anchorage and bursting steel.
6. Describe the procedures used to mark the profile of the tendon.
7. Describe the procedures used to cut, position and secure supports and conduit at specified locations.
8. Describe the procedures used to place and fasten tendon according to specifications.
 - selection
 - cutting

- lay out
- connection to anchorages
- protection of exposed tendons
- exclusion of concrete
- securing dead ends

9. Describe the procedures used to verify components remain stable during concrete pour.
10. Describe the procedures used to remove pocket-forming devices.
11. Describe the procedures used to install wedges.
12. Describe the procedures used to mark tendon to determine elongation.
13. Describe the procedures used to stress structure.
 - determine stressing sequence
 - tension and elongation
 - document elongation and gauge pressure on tendon
 - locking tendon
14. Describe the procedures used to disengage stressing equipment.
15. Describe approved methods used to de-stress tendon and their associated procedures if over-stressed.
16. Describe finishing off procedures.
 - cut off excess tendon
 - install grease cup and patch pockets
 - apply grout to voids in ducts

INSPECTION

17. Describe the procedures used to verify all steps in the post-tensioning sequence.
18. Identify the tools and equipment used for inspection and testing and describe the procedures for their calibration and use.
19. Describe the procedures used to repair surface damage.

Practical:

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

1. Theory only.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 17 and 21.

Course Outcomes:

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

- demonstrate knowledge of the inspection, erection and installation of robotic equipment for material handling and automated mechanical systems.

Theory:

1. Define terminology associated with robotic equipment.
2. Identify types of robotic equipment and describe their characteristics, components, and applications.
3. Describe the procedures used to inspect components and remove shipping stays.
4. Describe the procedures used to assemble robotic equipment and bring to point of installation according to specifications.
 - pre-assemble components
 - secure anchorage
 - install supports

Practical:

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

1. Theory only.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 17 and 24.

Course Outcomes:

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

- demonstrate knowledge of wooden structures and their erection.

Theory:

1. Describe the procedures used to prepare for erection of wooden structures.
 - identification and sorting of materials
 - receiving and inventory
 - off-loading structural wood material
 - storage of wood materials
2. Identify the assembly sequence and methods and associated procedures.
 - specifications and drawings
3. Describe erection methods and associated procedures.
 - lifting and spotting (positioning) components
 - plumbing and levelling
 - establishing elevations
 - bracing and framing
 - complete alignment
 - fastening
 - removal of plumb cables

Practical:

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

1. Theory only.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 15 and 17.

Course Outcomes:

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

- demonstrate knowledge of ornamental and miscellaneous ironwork and procedures for installation and finishing.

Theory:

1. Identify types of ornamental and miscellaneous ironwork and describe their components.
 - stairways
 - railings
 - panels
 - catwalks
 - fences
 - sound barriers
 - vehicle guard rails
 - vault work
 - prison doors
2. Describe the procedures used to plan and prepare for installation of various types of ironwork.
 - site preparation
 - material handling and movement
 - equipment
 - rigging
 - interpretation of drawings and prints
3. Describe the procedures used in the field to fabricate miscellaneous materials.
4. Describe the procedures used for finishing.
 - grinding
 - painting
 - filling procedures
 - cladding procedures
 - installing caps
 - polishing

Practical:

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

1. Fabricate and install:
 - handrails
 - stairways
 - door frames
 - roof opening

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 16 and 17.

Course Outcomes:

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

- demonstrate knowledge of erection and installation of pre-cast concrete components.

Theory:

1. Describe the procedures used to prepare for erection of pre-cast concrete members and components.
 - site preparation
 - selection and set up of equipment
 - interpretation of drawings and prints
 - calculation of weight
 - rigging procedures
 - material handling
 - layout
2. Describe the procedures used to verify location and condition of embedment.
3. Describe the procedures used to erect pre-cast members.
 - support clips
 - bearing pads
 - aligning, leveling and plumbing
 - fastening
 - installing gaskets
 - packing
 - caulking
 - air sealing
 - welding
4. Describe the procedures for cosmetic finishing.
 - patching
 - grouting
 - removing lugs
 - grinding
 - painting

Practical:

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

1. Develop a work site plan.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 6 and 17.

Course Outcomes:

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

- demonstrate knowledge of tower cranes and procedures used to assemble, erect, jump and dismantle.

Theory:**PRINCIPLES OF LEVERAGE**

1. Describe the basic principles of leverage associated with tower cranes.

ASSEMBLY

2. Identify different types of tower cranes and describe their characteristics and applications.
3. Describe the procedures used to prepare for assembly.
 - off-loading parts
 - inventories
 - laying out components
4. Describe the procedures used to erect tower cranes in accordance with manufacturers specifications.
 - level and plumb base section of the mast
 - install jacking section
 - install turntable
 - install counterjib
 - install jib sections/pennant lines on booms
 - secure counterweight
 - use built-in jacking systems
 - reeve blocks and sheaves along masts and booms
 - install trolleys and adjust lines
 - jump crane

INSPECTION AND DISASSEMBLY

5. Describe the procedures used to perform visual inspection of crane components.
6. Describe the sequence and procedures used to dismantle and store crane components as per crane specifications.

Practical:

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

1. Theory only.

IRW-1220 Derricks and Electric Overhead Travelling (EOT) Cranes

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 7 and 17.

Course Outcomes:

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

- demonstrate knowledge of derricks and electric overhead travelling cranes.

Theory:

DERRICKS

1. Describe the basic principles of leverage associated with derricks.
2. Identify different types of derricks and describe their characteristics, components and applications.

ELECTRIC OVERHEAD TRAVELLING (EOT) CRANES

3. Identify different types of electric overhead travelling cranes and describe their characteristics, components and applications.
4. Identify the types of operating controls for electric overhead travelling cranes and describe their use.
 - cab operated
 - remote
 - pendants
5. Describe the procedures used to assemble and install electric overhead travelling cranes components.
 - crane rails
 - trucks (wheels)
 - bridge girders
 - hoist and trolleys
 - crane stop
 - load blocks
 - cab

Practical:

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

1. Theory only.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 17 and 19.

Course Outcomes:

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

- demonstrate knowledge of reinforced concrete, its components and construction.

Theory:

1. Define terminology associated with reinforcing concrete.
2. Describe the purpose and composition of reinforced structural concrete.
3. Identify types of reinforcing steel and describe their characteristics and applications.
4. Describe the interpretation and use of drawings and prints.
 - detail sheets
 - shop drawings
 - working drawings and sketches
5. Identify types of ties, their characteristics and applications.
6. Describe the safety guidelines in regards to placing and tying reinforcing steel.
7. Describe the procedures used to tie reinforcing steel.

Practical:

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

1. Tie reinforcing steel.

IRW-1235 Reinforced Concrete 2 (Pre-assembly and Installation)

NOA Reference:

The material covered satisfies in whole or in part, the requirements of the National Occupational Analysis tasks 17 and 19.

Course Outcomes:

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

- demonstrate knowledge of the procedures used to pre-assemble and install reinforcing steel.

Theory:

1. Review the interpretation and use of drawings and prints.
 - detail sheets
 - shop drawings
 - working drawings and sketches
2. Describe the procedures used to mark location of reinforcing bar on form surfaces.
3. Identify types of bar supports and describe their applications.
 - chairs
 - beam balusters
 - slab spacers
 - bar spacers
4. Describe the procedure used to pre-assemble steel bars and wire mesh.
5. Describe the procedures used to install steel bar and wire mesh at predetermined locations.
6. Identify clearances associated with reinforcing steel.
7. Describe the procedures used to make splices.
8. Identify the bends standardized by:
 - CSA Standard G30, 18-m1992
 - 16-1967 and the American Concrete Institute
9. Describe the procedures used to cut and bend material to specifications.
10. Describe the various methods used to cut rebar and their associated procedures.

Practical:

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

1. Install and tie rebar.
2. Cut and bend materials according to specifications.
3. Perform splicing procedures.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 17 and 19.

Course Outcomes:

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

- demonstrate knowledge of procedures used to fabricate reinforcing steel.
- demonstrate knowledge of inspection procedures.

Theory:

1. Describe the procedures used to prepare for reinforcing concrete.
 - site preparation
 - interpretation of drawings and prints
 - symbols
 - selection and set up of equipment
 - off-loading steel
 - interpretation of detail sheets and bar codes
2. Describe the procedures used to reinforce concrete.
 - calculations
 - pre-assembly
 - bar placement
 - interpretation and use of drawings and prints
 - fabrication
 - bending and cutting
 - splicing
 - identify tolerances
3. Describe the procedures used to verify that installation meets specifications.
4. Describe the procedures used to verify that bar assemblies remain stable during concrete pour.
5. Describe the procedures used to verify clearances after concrete pour.

Practical:

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

1. Fabricate slab and beam.
2. Fabricate double wall.
3. Fabricate two columns.

IRW-1245 Temporary Access Structures and Working Platforms

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 17, 22 and 23.

Course Outcomes:

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

- demonstrate knowledge of temporary access structures, their assembly, erection and disassembly.
- demonstrate knowledge of temporary working platforms, their assembly, erection and disassembly.

Theory:

1. Identify types of temporary working platforms and describe their components, applications and procedures used to install.
 - power elevated working platforms
 - suspended scaffolds
2. Identify types of temporary access structures and describe their components, applications and procedures used for installation.
 - floats
 - scaffolds
 - man lifts
 - stairs
 - ladders
3. Describe lay-out and erection procedures for frame and tube scaffolds.
4. Identify and interpret relevant government regulations.
5. Describe the procedures used to evaluate conditions and suitability of base.
6. Describe requirements for inspection of temporary access structures and working platforms.
7. Describe the procedures and sequence for dismantling temporary access structures and working platforms.

Practical:

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

1. Erect and dismantle a scaffold using tube and clamp for bracing.
2. View a demonstration of a power elevated working platform and its operation.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis tasks 17 and 22.

Course Outcomes:

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

- demonstrate knowledge of falsework, its installation and dismantling.

Theory:

1. Describe false-work, its components and applications.
2. Describe the lay-out and erection procedures for false-work.
3. Identify and interpret relevant government regulations.
4. Describe the procedures used to evaluate conditions and suitability of base.
5. Describe the procedures and sequence used for shoring up structural components.
6. Describe requirements for inspection of false-work.
7. Describe the procedures and sequence for dismantling false-work.

Practical:

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

1. Theory only.

NOA Reference:

The material covered satisfies in whole or in part, the requirements of National Occupational Analysis task 14.

Course Outcomes:

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

- demonstrate knowledge of the layout and installation of curtain walls and window walls.
- demonstrate knowledge of the procedures used to glaze wall openings.

Theory:**PLANNING AND PREPARATION**

1. Describe assembly and erection procedures and sequence.
 - determine lay-down and assembly area
 - interpret drawings
 - off-load materials
 - identify components
 - select and set up equipment
 - select materials
 - rig loads
 - handle finished materials
2. Describe the procedures used to lay-out curtain walls and window walls.

INSTALLATION

3. Describe the procedures used to erect curtain walls and window walls.
4. Identify and interpret the information provided by drawings and prints.
 - structural blueprint
 - detail drawings
 - plan sequence
 - architectural drawings.
5. Describe the procedures used to verify location of embedment.
6. Describe the procedures used to assemble sections to be installed.
7. Describe the procedures used for installation.
 - interlock section with standing sections
 - align and level assembled sections
 - apply back-beading to curtain wall

- verify alignment and secure
- install flashing

FASTENING

8. Identify and interpret the information provided by the structural blueprint.
9. Describe lay-out procedures.
10. Describe the procedures used to drill holes.
11. Describe the procedures used to install support clips on structures.
12. Describe the procedures used to fasten wall sections.
13. Describe the procedures used to rig assembled sections.
 - equipment
 - safety
 - signals
 - sequence

GLAZING

14. Describe the equipment, techniques and procedures used to cut glass and plastic.
 - consult drawings, manufacturer's specifications
 - verify materials
 - verify alignment
 - cutting technique
15. Describe the procedures used to install and secure glass and plastic.
16. Describe the procedures used to apply sealer or sealant around glass according to specifications.

Practical:

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

1. Theory only.

REQUIRED RELATED COURSES

Description:

This course is designed to give students the opportunity to study the principles of effective writing. Applications include letters, memos, and short report writing.

Course Outcomes:

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

- 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 an informal report

Required Knowledge and Skills:**1.0 Review of Sentences and Paragraph Construction**

- 1.1.1 Define a sentence and review the four types.
- 1.1.2 Identify the essential parts of a sentence, particularly subject and predicate, direct and indirect object.
- 1.1.3 Differentiate among phrases, clauses, and sentences.
- 1.1.4 Explore the major concepts related to subject-verb agreement.

- 1.1.5 Apply rules and principles for writing clear, concise, complete sentences which adhere to the conventions of grammar, punctuation, and mechanics.

1.2 Examine and Apply Principles of Paragraph Construction

- 1.2.1 Discuss the basic purposes for writing.
- 1.2.2 Define a paragraph and describe the major characteristics of an effective paragraph.
- 1.2.3 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.

2.0 Business Correspondence**2.1 Examine the Value of Business Writing Skills**

- 2.1.1 Discuss the importance of effective writing skills in business

2.1.2 Discuss the value of well-developed writing skills to career success

2.2 Examine Principles of Effective Business Writing

- 2.2.1 Discuss the rationale and techniques for fostering goodwill in business communication, regardless of the circumstances
- 2.2.2 Review the importance of revising and proofreading writing

2.3 Examine Business Letters and Memos

- 2.3.1 Differentiate between letter and memo applications in the workplace
- 2.3.2 Identify the parts of a business letter and memo
- 2.3.3 Explore the standard formats for business letters and memos
- 2.3.4 Examine guidelines for writing an acceptable letter and memo which convey: acknowledgment, routine request, routine response, complaint, refusal, and persuasive request, for three of the six types listed
- 2.3.5 Examine samples of well-written and poorly written letters and memos

3.0 Informal Report

3.1 Examine the Fundamentals of Informal Business Reports

- 3.1.1 Identify the purpose of the informal report
- 3.1.2 Identify the parts and formats of an informal report
- 3.1.3 Identify methods of information gathering

3.2 Apply Informal Report Writing Skills and Oral Reporting Skills

- 3.2.1 Gather pertinent information
- 3.2.2 Organize information into an appropriate outline
- 3.2.3 Draft a five minute informal report
- 3.2.4 Edit, proofread, and revise the draft to create an effective informal report and present orally using visual aids.

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:

- know and understand quality customer service
- know why quality service is important
- know and understand the relationship between “service” and “sales”
- understand the importance of and to demonstrate a positive attitude
- recognize and demonstrate handling of customer complaints

Required Knowledge and Skills:**1. Providing Quality Service**

- Define quality service
- List the types of quality service
- Define Service vs. Sales or Selling
- Explain why quality service is important
- Identify the various types of customers
- Define customer loyalty

2. Determining Customers Wants and Needs

- List four levels of customer needs
- Identify important customer wants and needs
- Identify ways to ensure repeat business

3. Demonstrating a Positive Attitude

- List the characteristics of a positive attitude
- Explain why it is important to have a positive attitude
- List ways that a positive attitude can improve a customer's satisfaction
- Define perception
- Explain how perception can alter us and customers
- Understand how to deal with perception

4. Effectively Communicating with customers

- Describe the main elements in the communication process
- Identify some barriers to effective communication
- Define body language
- Explain how body language would affect customers
- Determine why body language is important
- Define active listening and state why it is important
- Describe the four components of active listening
- Contrast good and bad listeners
- List and discuss the steps of the listening process

5. Effectively using Questioning Techniques

- List questioning techniques
- Write two examples of an open question
- Perform a questioning and listening role play

6. Using the Telephone Effectively

- List the qualities of a professional telephone voice
- Explain why telephone skills are important
- Demonstrate effective telephone skills

7. Asserting Oneself: Handling Complaints and Resolving Conflict

- Define assertiveness
- Define communication behaviours
- Relate assertions to effective communication
- Practice being assertive
- Understand the process of assertive guidelines for action
- Practice giving an assertive greeting
- Acknowledge multiple customers

8. Dealing with Difficult Customers

- Describe how you would deal with anger
- Complete a guide to controlling feelings
- Determine how you would feel dealing with an upset customer
- Suggest some techniques that might control your own feelings
- Understand leadership styles and the nature of organizations
- List ways to deal with conflict / customer criticism
- Be aware of certain guidelines when confronting customers
- List ways of preventing unnecessary conflict with customers
- Review current skills and knowledge of customer service
- Develop a customer satisfaction improvement plan

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
- develop an awareness of quality management principles and processes

Required Knowledge and Skills:

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 engineering drawings 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 quality management.
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.
10. Explain the concepts of quality
 - a. cost of quality
 - b. measurement of quality
 - c. quality control and quality assurance
 - d. elements of quality
 - e. elements of the quality audit

- f. quality standards
- g. role expectations and responsibilities

11. Explain the structure of quality assurance and quality control

- a. Define quality assurance, quality control and documentation terminology
- b. Describe organizational charts
- c. List the elements of a quality assurance system
- d. Explain the purpose of the quality assurance manual
- e. Describe quality assurance procedures
- f. Explain the key functions and responsibilities of personnel

12. Complete quality assurance/quality control documentation

- a. Describe methods of recording reports in industry
- b. Describe procedures of traceability (manual and computer-based recording)
- c. Identify needs for quality control procedures

13. Apply quality control to projects

- a. Follow QA/QC procedures for drawings, plans and specifications in applicable occupations.
- b. Calibrate measuring instruments and devices in applicable occupations.
- c. Interpret required standards
- d. Follow QA/QC procedures for accepting raw materials
- e. Carry out the project
- f. Control the quality elements (variables)
- g. Complete QA/QC reports

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.

Course Outcomes:

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

- computer systems and their operation.
- popular software packages, their applications and future trends in computer applications

Required Knowledge and Skills:**1. Microcomputer System Hardware and Software Components****1.1 Microcomputer Hardware****1.1.1 System Components**

1.1.1.1 Identify major components of a computer system.

1.1.2 Function of each Component

1.1.2.1 Describe the function of the microprocessor.

1.1.2.2 Describe and give examples of I/O DEVICES.

1.1.2.3 Describe primary storage (RAM, ROM, Cache).

1.1.2.4 Define bit, byte, code and the prefixes k.m. and g.

1.1.2.5 Describe secondary storage (diskettes and hard disks, CD ROMS, Zip Drives etc).

1.1.2.6 Describe how to care for a computer and its accessories.

1.2 Microcomputer Software**1.2.1 Software Definition and Types**

1.2.1.1 Define software.

1.2.1.2 Describe, operational and application software used in this course.

1.2.1.3 Define file and give the rules for filenames and file extensions..

- 1.2.2 System Software (Windows 95)
 - 1.2.2.1 Getting Started with Windows
 - 1.2.2.2 Start and quit a Program
 - 1.2.2.3 Get Help
 - 1.2.2.4 Locate a specific file using the **find** function of Win95
 - 1.2.2.5 Changing system settings:wall paper, screen saver, screen resolution, background.
 - 1.2.2.6 Starting a program by using the Run Command
 - 1.2.2.7 Shutting down your computer
- 1.2.3 File Management Commands (Windows 95)
 - 1.2.3.1 View directory structure and folder content
 - 1.2.3.2 Organizing files and folders
 - 1.2.3.3 Copy, delete, and move files and folders
 - 1.2.3.4 Create folders
 - 1.2.3.5 Maximize and minimize a window
 - 1.2.3.6 Print directory/folder content
 - 1.2.3.7 Describe the Windows 95 taskbar

2. Word Processing

2.1 Keyboarding Techniques

- 2.1.1 Identify and locate alphabetic and numeric keys
- 2.1.2 Identify and locate function keys: special keys, home keys, page up key, page down key, numeric key pad, shift keys, punctuation keys, tab key

2.2 Word Processing

2.2.1 Understanding word processing

- 2.2.1.1 The Windows Component
- 2.2.1.2 The Menu Bar
- 2.2.1.3 Menu Indicators
- 2.2.1.4 The Document Window
- 2.2.1.5 The Status Bar
- 2.2.1.6 The Help Feature
- 2.2.1.7 Insertion Point Movements

2.2.2 Create a document

- 2.2.2.1 Change the Display
- 2.2.2.2 The Enter Key
- 2.2.2.3 Enter Text

- 2.2.3 Save, Open and Exit a document.
 - 2.2.3.1 Save a document
 - 2.2.3.2 Close a document.
 - 2.2.3.3 Start a new document Window
 - 2.2.3.4 Open a document
 - 2.2.3.5 Exit Word Processor
- 2.2.4 Edit a Document
 - 2.2.4.1 Add New Text
 - 2.2.4.2 Delete text
 - 2.2.4.3 Basic Format Enhancement (split and join paragraphs, insert text)
- 2.2.5 Understand Hidden Codes
 - 2.2.5.1 Display Hidden Codes
 - 2.2.5.2 Delete Text Enhancements
- 2.2.6 The Select Feature
 - 2.2.6.1 Identify a Selection
 - 2.2.6.2 Move a Selection
 - 2.2.6.3 Copy a Selection
 - 2.2.6.4 Delete a Selection
 - 2.2.6.5 Select Enhancements
 - 2.2.6.6 Save a Selection
 - 2.2.6.7 Retrieve a Selection
- 2.2.7 Change Layout Format
 - 2.2.7.1 Change layout format: (margins, spacing, alignment, paragraph indent, tabs, line spacing, page numbering)
- 2.2.8 Change Text Attributes
 - 2.2.8.1 Change text attributes: (bold, underline, font, etc.)
- 2.2.9 Use Auxiliary Tools
 - 2.2.9.1 Spell Check
- 2.2.10 Select the Print Feature
 - 2.2.10.1 Select the Print Feature: (i.e; number of copies and current document)

2.2.10.2 Identify various options in print screen dialogue box

3. Electronic Spreadsheet

3.1 Spreadsheet Basics

3.1.1 The Worksheet Window

3.2 Operates Menus

- 3.2.1 Use a Menu Bar
- 3.2.2 Use a Control Menu
- 3.2.3 Use a Shortcut Menu
- 3.2.4 Save, Retrieve from Menus

3.3 Create a Worksheet

- 3.3.1 Enter Constant Values and Formulas
- 3.3.2 Use the Recalculation Feature
- 3.3.3 Use Cell References (relative and absolute references)

3.4 Use Ranges

- 3.4.1 Type a Range for a Function
- 3.4.2 Point to a Range for a Function
- 3.4.3 Select a Range for Toolbar and Menu Commands

3.5 Print a Worksheet

- 3.5.1 Print to the Screen
- 3.5.2 Print to the Printer
- 3.5.3 Print a Selected Range

3.6 Edit a Worksheet

- 3.6.1 Replace Cell Contents
- 3.6.2 Insert and Delete Rows and Columns
- 3.6.3 Change Cell Formats
- 3.6.4 Change Cell Alignments
- 3.6.5 Change Column Width
- 3.6.6 Copy and Move Cells

4. Electronic Mail and the Internet

4.1 Electronic Mail

- 4.1.1 Compose and send an e-mail message
- 4.1.2 Retrieve an e-mail attachments

- 4.1.3 Send an e-mail message with attachments
- 4.1.4 Retrieve and save e-mail attachments
- 4.1.3 Print an e-mail message
- 4.1.4 Delete an e-mail message

4.2 The Internet

- 4.2.1 Overview of the World Wide Web
- 4.2.2 Accessing Web sites
- 4.2.3 Internet Web Browsers
- 4.2.4 Internet Search Engines
- 4.2.5 Searching Techniques

Description:

This course involves participating in meetings, doing safety inspections, completing employment insurance forms, writing letters of employment insurance appeal, and filing a human rights complaint. Includes information on formal meetings, unions, worker's compensation, employment insurance regulations, worker's rights and human rights.

Course Outcomes:

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

- Participate in meetings (conduct meetings).
- Be aware of union procedures
- Be aware of workers' compensation regulations.
- Be aware of occupational health and safety regulations.
- Be aware of employment insurance regulations
- Be aware of workers' rights.
- Be aware of human rights

Required Knowledge and Skills:

1. Meetings
 - a. Explain preparation requirements prior to conducting a meeting
 - b. Explain the procedures for conducting a meeting.
 - c. Explain participation in meetings.
 - d. Explain the purpose of motions.
 - e. Explain the procedure to delay discussion of motions.
 - f. Explain how to amend and vote upon a motion.
2. Unions
 - a. Why do unions exist?
 - b. Give a concise description of the history of Canadian labour.
 - c. How do unions work?
 - d. Explain labour's structure.
 - e. Describe labour's social objectives.
 - f. Describe the relationship between Canadian labour and the workers.
 - g. Describe the involvement of women in unions.
3. Worker's Compensation
 - a. Describe the aims, objectives, benefits and regulations of the Workers Compensation Board.
 - b. Explain the internal review process.
4. Occupational Health and Safety
 - a. Describe the rules and regulations directly related to your occupation.

5. Employment Insurance Regulations
 - a. Explain employment insurance regulations
 - b. Describe how to apply for employment insurance.
 - c. Explain the appeal process.
6. Worker's Rights
 - a. Define labour standards.
 - b. Explain the purpose of the Labour Standards Act.
 - c. List regulations pertaining to:
 - i. Hours of work.
 - ii. Minimum wages.
 - iii. Employment of children.
 - iv. Vacation pay
7. Human Rights
 - a. Describe what information cannot be included on an application.
 - b. Describe what information cannot be included in an interview
 - c. Why is there a Human Rights Code?
 - d. Define sexual harassment.
8. Participate in meetings.
 - a. Follow the form of getting a motion on the floor
 - b. Discuss a motion
 - c. Amend a motion
 - d. Vote on a motion.
9. Complete a safety inspection of your shop.
10. Complete an employment insurance application form.
11. Write a letter of appeal.
12. Analyze a documented case of a human rights complaint with special emphasis on the application form, time frame, documentation needed, and legal advice available.

Description:

This fifteen-hour seminar is designed to give students an introduction to the critical elements of effective job search techniques.

Required Knowledge and Skills:**Examine and Demonstrate Elements of Effective Job Search Techniques**

- Identify and examine employment trends and opportunities
- Identify sources that can lead to employment
- Discuss the importance of fitting qualifications to job requirements
- Discuss and demonstrate consideration in completing job application forms
- Establish the aim/purpose of a resume
- Explore characteristics of effective resumes, types of resumes, and principles of resume format
- Explore characteristics of and write an effective cover letter
- Explore, and participate in a role play of a typical job interview with commonly asked questions and demonstrate proper conduct
- Explore other employment related correspondence
- Explore the job market to identify employability skills expected by employer
- Conduct a self-analysis and compare with general employer expectations

Description:

This fifteen-hour seminar 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.

Required Knowledge and Skills:

1. Explore Self-Employment: An Alternative to Employment
 - Identify the advantages and disadvantages of self-employment vs. regular employment
 - Differentiate between an entrepreneur and a small business owner
 - Evaluate present ideas about being in business
2. Explore the Characteristic of Entrepreneurs
 - Identify characteristics common to entrepreneurs
 - Relate their own personal characteristics with those of entrepreneurs.
 - Evaluate their present ideas about business people
3. Identifying Business Opportunities
 - Distinguish between an opportunity and an idea.
 - List the existing traditional and innovative business ventures in the region.
 - Explain the general parameters between which business ventures should fit.
 - Summarize the role of such agencies Regional Economic Development Boards, Business Development Corporations, etc.
 - Identify potential business opportunities within the region.
4. Demystifying the Entrepreneurial Process.
 - Explain the entrepreneurial process
 - Describe the purpose of a business plan
 - Identify the main ingredients of a business plan
 - Summarize the role of such agencies as BDC's, ACOA, Women's Enterprise Bureau etc.
 - List other agencies where assistance - financial and otherwise - is available to those interested in starting a business venture.