

Pre-Employment Plan of Training



PLAN OF TRAINING

Pre-Employment Metal Fabricator (Fitter)

APRIL 2016



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

Approved by:

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Chairperson, Provincial Apprenticeship and Certification Board

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Preface

This curriculum standard is aligned with the 2016 level 1 Atlantic Apprenticeship Curriculum Standard (AACS) and the 2012 National Occupational Analysis for the Metal Fabricator (Fitter) trade. It describes the curriculum content for the Metal Fabricator (Fitter) pre-employment training program.

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We offer a sincere thank you.

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Pre-employment Plan of Training – Metal Fabricator (Fitter)

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A. NOA Comparison Chart

A National Occupational Analysis (NOA) comparison chart is located in the Atlantic Apprenticeship Curriculum Standard (AACS).

B. Program Structure

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

The order of course delivery within each Level can be determined by the educational agency, as long as pre-requisite conditions are satisfied.

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

A Pre-employment student who becomes an apprentice will also be required to complete Level 2 and 3 in the AACs.

PRE-EMPLOYMENT				
Course No.	AACS No.	Course Name	Hours	Pre-Requisite(s)
TS1510	-	Occupational Health and Safety	6	None
TS1520	-	WHMIS	6	None
TS1530	-	Standard First Aid	14	None
WD1390	WDF-005	Safety	6	None
WD1190	WDF-010	Tools and Equipment	60	TS1520, TS1530, WD1390
WD1185	-	Bending and Rolling	4	SF1460
WD1270	WDF-070	Shielded Metal Arc Welding (SMAW) Butt Joint – Flat and Horizontal Positions (F-4 Class Electrodes) – Mild Steel	30	WD1620
WD1821	WDF-600	GMAW (Gas Metal Arc Welding) 2-Fillet Weld All Positions, Mild Steel	18	WD1630
WD1602	WDF-605	Oxy-Fuel Cutting, Heating, Gouging and Welding	60	TS1530
WD1610	WDF-040	SMAW (Sheet Metal Arc Welding) 1 – Set-up, Strike and Maintain an Arc	30	WD1600
WD1620	WDF-045	SMAW 2 – Fillet Weld All Positions	60	WD1610

PRE-EMPLOYMENT				
Course No.	AACS No.	Course Name	Hours	Pre-Requisite(s)
	WDF-065			
WD1631	WDF-050 WDF-065	GMAW (Gas Metal Arc Welding) 1 – Set-up and Maintain an Arc	18	WD1610
WD1641	WDF-035	GTAW (Gas Tungsten Arc Welding) 1-Set-up and Deposit a Weld	18	WD1190, WD1602
WD1651	WDF-615	Plasma Arc Cutting and Gouging	12	WD1190
WD1661	WDF-075	Blueprint Reading 1 (Basic)	30	WD1610
WD1670	WDF-075	Blueprint Reading 2 (Welding Symbols)	30	WD1660
WD1682	WDF-630	Metallurgy	18	WD1610
WD1701	WDF-015	Stationary Machinery	12	SF1420
WD1721	-	Jigs and Fixtures	12	WD1730
WD1730	WDF-070	Fabrication Fundamentals	15	SF1420
WD1741	WDF-055 WDF-060	FCAW (Flux Core Arc Welding) 1-Set-Up and Deposit a Weld	18	WD1190, WD1602
WD1815	WDF-635	Fillet and Groove Weld, Medium and High Carbon Steel using FCAW, GMAW, GTAW, MCAW and SMAW	6	One of: WD1610; WD1631; WD1641;WD1741
WD1832	WDF-640	GMAW (Gas Metal Arc Welding) 3-Groove Weld, All Positions, Mild Steel	30	WD1821
WD1430	WDF-020 WDF-025	Hoisting, Lifting, Rigging and Access Equipment	30	TS1510
WD1761	WDF-610	Air-Arc Cutting and Gouging	9	WD1270
WD1770	WDF-035	Submerged Arc Welding Set-up	4	-
WD2410	WDF-035	Stud and Spot Resistance Welding	4	-

PRE-EMPLOYMENT				
Course No.	AACS No.	Course Name	Hours	Pre-Requisite(s)
SF1140	WDF-075	Blueprint Reading (Shop Drawings)	30	WD1670
SF1400	-	Press Brake Operation	45	SF1460
SF1410	-	Roll Forming Equipment and Operation	45	WD1185
SF1150	WDF-085	Layout Introduction and Parallel Line Development	40	WD1660
SF1160	-	Radial and Triangulation Layout	50	SF1430
SF1460	-	Basic Plate Development	120	SF1450
SF1470	-	Basic Assembly and Fitting	40	SF1420
AM1000	-	Introduction to Essential Skills	9	None
AM1101*	-	Math Essentials	42	None
AM1231	-	Metal Fabrication Math Fundamentals	42	AM1101
CM2161	-	Communication Essentials	36	None
SD1761	-	Workplace Essentials	24	None
MC1062	-	Computer Essentials	15	None
AP1102	-	Introduction to Apprenticeship	12	None
Total Hours			1110	

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

PRE-EMPLOYMENT

TS1510 Occupational Health and Safety

Learning Outcomes:

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

Duration: 6 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Interpret the Occupational Health and Safety Act laws and regulations.
 - i. explain the scope of the act
 - application of the act
 - Federal/Provincial jurisdictions
 - Canada Labour Code
 - rules and regulations
 - private home application
 - conformity of the Crown by the Act
2. Explain responsibilities under the Act and Regulations.
 - i. duties of employer, owner, contractors, sub-contractors, employees, and suppliers

3. Explain the purpose of joint health and safety committees.
 - i. formation of committee
 - ii. functions of committee
 - iii. legislated rights
 - iv. health and safety representation
 - v. reporting endangerment to health
 - vi. appropriate remedial action
 - vii. investigation of endangerment
 - viii. committee recommendation
 - ix. employer's responsibility in taking remedial action
4. Examine right to refuse dangerous work.
 - i. reasonable grounds for refusal
 - ii. reporting endangerment to health
 - iii. appropriate remedial action
 - iv. investigation of endangerment
 - v. committee recommendation
 - vi. employer's responsibility to take appropriate remedial action
 - vii. action taken when employee does not have reasonable grounds for refusing dangerous work
 - viii. employee's rights
 - ix. assigning another employee to perform duties
 - x. temporary reassignment of employee to perform other duties
 - xi. collective agreement influences
 - xii. wages and benefits
5. State examples of work situations where one might refuse work.
6. Describe discriminatory action.
 - i. definition
 - ii. filing a complaint procedure
 - iii. allocated period of time a complaint can be filed with the Commission
 - iv. duties of an arbitrator under the Labour Relations Act
 - v. order in writing inclusion
 - vi. report to commission Allocated period of time to request Arbitrator to deal with the matter of the request
 - vii. notice of application
 - viii. failure to comply with the terms of an order
 - ix. order filed in the court

7. Explain duties of commission officers.
 - i. powers and duties of officers
 - ii. procedure for examinations and inspections
 - iii. orders given by officers orally or in writing
 - iv. specifications of an order given by an officer to owner of the place of employment, employer, contractor, sub-contractor, employee, or supplier
 - v. service of an order
 - vi. prohibition of persons towards an officer in the exercise of his/her power or duties
 - vii. rescinding of an order
 - viii. posting a copy of the order
 - ix. illegal removal of an order
8. Interpret appeals of others.
 - i. allocated period of time for appeal of an order
 - ii. person who may appeal order
 - iii. action taken by Commission when person involved does not comply with the order
 - iv. enforcement of the order
 - v. notice of application
 - vi. rules of court
9. Explain the process for reporting of accidents.
 - i. application of act
 - ii. report procedure
 - iii. reporting notification of injury
 - iv. reporting accidental explosion or exposure
 - v. posting of act and regulations

Practical Requirements:

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

TS1520 Workplace Hazardous Materials Information System (WHMIS)

Learning Outcomes:

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

Duration: 6 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Define WHMIS safety.
 - i. rational and key elements
 - ii. history and development of WHMIS
 - iii. WHMIS legislation
 - iv. WHMIS implementation program
 - v. definitions of legal and technical terms
2. Examine hazard identification and ingredient disclosure.
 - i. prohibited, restricted and controlled products
 - ii. classification and the application of WHMIS information requirements
 - iii. responsibilities for classification
 - the supplier
 - the employer
 - the worker - Classification: rules and criteria
 - information on classification
 - classes, divisions and subdivision in WHMIS
 - general rules for classification
 - class A - compressed gases
 - class B - flammable and combustible materials
 - class C - oxidizing material
 - class D - poisonous and infectious material
 - class E - corrosive material
 - class F - dangerously reactive material
 - iv. products excluded from the application of WHMIS legislation
 - consumer products
 - explosives
 - cosmetics, drugs, foods and devices
 - pest control products
 - radioactive prescribed substances
 - wood or products made of wood
 - manufactured articles

- tobacco or products of tobacco
- hazardous wastes
- products handled or transported pursuant to the Transportation of Dangerous Goods (TDG) Act
- v. comparison of classification systems - WHMIS and TDG
- vi. general comparison of classification categories
- vii. detailed comparison of classified criteria

3. Explain labeling and other forms of warning.

- i. definition of a WHMIS label
 - supplier label
 - workplace label
 - other means of identification
- ii. responsibility for labels
 - supplier responsibility
 - employer responsibility
 - worker responsibility
- iii. introduce label content, design and location
 - supplier labels
 - workplace labels
 - other means of identification

4. Introduce material safety data sheets (MSDS).

- i. definition of a material safety data sheet
- ii. purpose of the data sheet
- iii. responsibility for the production and availability of data sheets
 - supplier responsibility
 - employer responsibility
 - workers responsibility

Practical Requirements:

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

TS1530 Standard First Aid

Learning Outcomes:

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

Duration: 14 Hours

Pre-Requisite(s): None

Practical Requirements:

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

WD1390 Safety

Learning Outcomes:

- Demonstrate knowledge of safety equipment, their applications, maintenance and procedures for use.
- Demonstrate knowledge of safe work practices.
- Demonstrate knowledge of regulatory requirements pertaining to safety.

Duration: 6 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Identify types of personal protective equipment (PPE) and clothing and describe their applications and limitations.
 - i. respiratory protection
 - ii. hearing protection
 - iii. eye protection
 - iv. fall protection
 - v. head protection
 - vi. foot protection
 - vii. hand protection
2. Describe the procedures used to care for and maintain PPE.
3. Identify hazards and describe safe work practices.
 - i. personal
 - ii. workplace
 - job hazard assessment procedures
 - lockout/tag out
 - confined space awareness
 - trenches and excavations
 - explosion and fire (hot work)
 - heights (fall protection and fall arrest)
 - ventilation/fumes
 - iii. environmental contamination (awareness of)

Practical Requirements:

None.

WD1190 Tools and Equipment

Learning Outcomes:

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

Duration: 60 Hours

Pre-Requisite(s): TS1520, TS1530, WD1390

Objectives and Content:

1. Interpret regulations pertaining to tools and equipment.
2. Identify types of hand tools and describe their applications and procedures for use.
3. Describe the procedures used to inspect, maintain and store hand tools.
4. Identify types of power tools and describe their applications and procedures for use.
 - i. electric
 - ii. hydraulic
 - iii. pneumatic
5. Identify power tool attachments and consumables and describe their applications and procedures for use.
6. Describe the procedures used to inspect, maintain and store power tools.
7. Identify types of layout and measuring tools and equipment and describe their applications and procedures for use.
8. Describe the procedures used to inspect, maintain and store layout and measuring tools and equipment.

Practical Requirements:

1. Layout lines on flat bar.
2. Layout drill gauge.
3. Use tools to cut outlines laid out on flat bar and cut out drill gauge.
4. Layout and fabricate drilling and threading exercise as per assigned project.
5. Layout and fabricate circle cutting attachment.
6. Install grinding wheels on stationary grinder.
7. Grind metals with stationary grinders.
8. Demonstrate use of wheel dresser.
9. Grind metals with a portable grinder.

WD1185 Bending and Rolling

Learning Outcomes:

- Demonstrate knowledge of bending and rolling equipment.

Duration: 4 Hours

Pre-Requisite(s): SF1460

Objectives and Content:

1. Define terminology associated with bending and rolling requirements.
 - i. tonnage
 - ii. spacing
 - iii. clearance
 - iv. calculations
2. Identify the types of equipment used to bend and roll metal, and describe their applications, maintenance and procedures for use.

Practical Requirements:

None.

WD1270 Shielded Metal Arc Welding (SMAW) Butt Joint – Flat and Horizontal Positions (F-4 Class Electrodes) – Mild Steel

Learning Outcomes:

- Demonstrate knowledge of the procedures used to weld butt joints on mild steel in the flat and horizontal positions with F-4 class electrodes using the SMAW process.
- Demonstrate knowledge of the procedures used to test welds.

Duration: 30 Hours

Prerequisite(s): WD1620

Objectives and Content:

1. Describe the procedures used to weld butt joints on mild steel in the flat position.
 - i. material preparation
 - ii. joint preparation
 - iii. inspection and testing
2. Describe the procedures used to weld butt joints on mild steel in the horizontal position.
 - i. material preparation
 - ii. joint preparation
 - iii. inspection and testing
3. Describe the procedures used to test welds.

Practical Requirements:

1. Weld butt joints in the flat and horizontal position with F-4 electrodes using the SMAW process.
2. Conduct a visual inspection of the edge preparation joint fit-up and completed weld assembly.
3. Conduct a bend test.
4. Conduct a tacker break test.

WD1821 GMAW (Gas Metal Arc Welding) 2-Fillet Weld All Positions, Mild Steel

Learning Outcomes:

- Demonstrate knowledge of the procedures used to prepare base metals and joints for gas metal arc welding (GMAW) fillet welds.
- Demonstrate knowledge of the procedures used to perform fillet welds on mild steel plate in all positions using the GMAW process.
- Demonstrate knowledge of the procedures used to perform visual weld inspections.

Duration: 18 Hours

Pre-Requisites: WD1631

Objectives and Content:

1. Define terminology associated with GMAW fillet welds.
 - i. conventional and pulse
 - ii. identification of position
 - iii. modes of transfer
 - short circuiting
 - globular
 - spray
 - pulse spray
 - iv. shielded gas selection
 - v. filler metals
 - vi. troubleshooting
 - vii. work and travel angles
 - viii. gun manipulation
2. Identify the considerations when selecting consumables and determining equipment set-up for performing GMAW fillet welds on mild steel in all positions.
 - i. specification requirements
 - ii. base metal
 - composition
 - thickness
 - iii. shielding gas selection
 - iv. power source
 - v. welding position
 - vi. joint type and design
3. Identify the requirements and describe the procedures to store consumables used for GMAW fillet welds on mild steel plate.

4. Describe the procedures used to prepare base metals and joints for GMAW fillet welds.
5. Describe the procedures used to perform fillet welds on mild steel plate in all positions using the GMAW process.
6. Describe the procedures used to prevent and correct weld faults.

Practical Requirements:

1. Perform fillet welds on mild steel plate.
 - i. flat
 - ii. vertical down
 - iii. overhead
2. Perform a visual weld inspection.

WD1602 Oxy-fuel Cutting, Heating Gouging and Welding

Learning Outcomes:

- Demonstrate knowledge of oxy-fuel equipment and accessories.
- Demonstrate knowledge of the procedures used to cut with oxy-fuel equipment.
- Demonstrate knowledge of the procedures used to gouge with oxy-fuel equipment.
- Demonstrate knowledge of the procedures used to weld with oxy-fuel equipment.
- Demonstrate knowledge of the procedures used to braze with oxy-fuel equipment.

Duration: 60 Hours

Pre-Requisite(s): TS1520, TS1530, WD1390

Objectives and Content:

1. Define terminology associated with oxy-fuel cutting, gouging and welding.
2. Identify hazards and describe safe work practices pertaining to oxy-fuel cutting, gouging and welding.
 - i. personal
 - ii. shop/facility
 - iii. fire and explosion
 - iv. equipment
 - v. ventilation/fumes
 - vi. storage, handling and transportation
3. Identify and interpret codes and regulations pertaining to oxy-fuel cutting, gouging and welding equipment and operations.
4. Identify oxy-fuel equipment and accessories and describe their applications and limitations.
 - i. cutting
 - ii. gouging
 - iii. welding
 - iv. brazing/braze-welding
 - v. heating
5. Identify types of flames and describe their application and the procedures for flame adjustment.
 - i. oxidizing
 - ii. carburizing
 - iii. neutral

6. Describe the procedures used to set-up, adjust and shut down oxy-fuel equipment.
 - i. manufacturers' recommendations
7. Describe the procedures used to inspect and maintain oxy-fuel equipment.
8. Describe the procedures used to cut materials using oxy-fuel equipment.
 - i. free hand
 - ii. guided
 - straight edge
 - pattern
 - iii. automated/semi-automated
9. Identify common cutting faults and describe the procedures to prevent and correct them.
10. Describe the procedures used to gouge using oxy-fuel equipment.
11. Describe the procedures used to weld using oxy-fuel equipment.
12. Describe the procedures used to braze/braze-weld using oxy-fuel equipment.

Practical Requirements:

1. Cutting.
 - i. straight cutting
 - ii. bevel cutting
 - iii. Gouging.
 - i. gouge groove in flat plate
3. Fusion Welding.
 - i. closed corner
 - ii. horizontal lap joint
 - iii. square butt joint
4. Bronze Welding.
 - i. horizontal lap joint
 - ii. square butt joint
5. Silver Brazing.
 - i. copper/steel tee joint

- ii. copper tee and tubing
- iii. copper to copper (silfos)

WD1610 SMAW (Shielded Metal Arc Welding) 1 Set-up, Strike and Maintain an Arc

Learning Outcomes:

- Demonstrate knowledge of the procedures used to set-up and maintain an arc.
- Demonstrate knowledge of the procedures used to deposit a weld bead.

Duration: 30 Hours

Pre-Requisite(s): WD1600

Objectives and Content:

1. Define the terminology associated with arc welding.
 - i. mild steel and low alloy steel electrodes
 - ii. AC (Alternating Current)
 - iii. DC (Direct Current) (polarity)
 - iv. Arc Blow
 - v. duty cycle
 - vi. rated amperage
2. Describe the SMAW process.
 - i. general precautions
 - ii. equipment and accessories
 - personal protective equipment
 - ground clamps
 - terminal lugs
 - electrode holders
 - cable connectors
 - cables
 - iii. electrodes
 - iv. codes and standards

3. Describe the characteristics and applications of different power sources.
 - i. AC transformers
 - ii. AC/DC rectifiers
 - iii. DC generators
 - iv. engine drive (gasoline, diesel)
 - v. inverters
4. Describe the set-up and maintenance of welding equipment used in the SMAW process.
5. Describe the procedures used to strike and maintain an electric arc.
6. Describe the procedures and techniques used to deposit a weld bead.
 - i. stringer
 - ii. weave
 - iii. arc length
 - iv. travel speed
 - v. work and travel angles
 - vi. visual inspection

Practical Requirements.

1. Set-up welding equipment check the various external components.
2. Tack weld with (6011) 4311 and (7018) 4918 electrodes.
3. Deposit stringer beads with 4311 and 4918 electrodes.
4. Deposit weave beads with 4311 and 4918 electrodes.
5. Perform padding with 4311 and 4918 electrodes.

WD1620 SMAW 2 – Fillet Weld All Positions

Learning Outcomes:

- Demonstrate knowledge of the procedures used to fillet weld mild steel in all positions using the SMAW process.
- Demonstrate knowledge of the procedures used to perform visual inspection of welds.

Duration: 60 Hours

Pre-Requisite(s): WD1610

Objectives and Content:

1. Identify types of joints and their characteristics.
 - i. tee
 - ii. lap
 - iii. corner
2. Identify types of fillet welds and describe their applications.
 - i. tack
 - ii. composite
 - iii. single-pass
 - iv. multi-pass
 - v. plug
 - vi. slot
3. Describe the procedures used to fillet weld on mild steel in all positions.
 - i. identify position
 - limitations
 - ii. identify material
 - iii. determine thickness of material
 - iv. determine fillet size
 - v. select electrode

- vi. select current

4. Describe the procedures used to test welds.
 - i. destructive
 - ii. non-destructive (visual inspection)
5. Describe weld faults and their causes.

Practical Requirements:

1. Perform welds on tee lap and corner joint, all positions.

WD1631 GMAW (Gas Metal Arc Welding) 1-Set-up and Maintain an Arc

Learning Outcomes:

- Demonstrate knowledge of gas metal arc welding (GMAW) welding equipment, consumables and accessories.
- Demonstrate knowledge of the procedures used to set-up, adjust, operate, inspect and maintain GMAW welding equipment.
- Demonstrate knowledge of the procedures used to deposit a weld bead using GMAW welding equipment.
- Demonstrate knowledge the procedures used to perform visual weld inspections.

Duration: 18 Hours

Pre-Requisite(s): WD1190, WD1602

Objectives and Content:

1. Describe the purpose, applications and advantages of GMAW.
2. Define terminology associated with GMAW welding.
 - i. general precautions
 - ii. equipment and accessories
 - shielding gas and regulators
 - electrode wire
 - gun
 - feeder
 - power source
 - nozzle
 - cable connections
 - cables
 - pulsed arc machines
 - iii. metal transfers
 - iv. polarity
 - v. arc voltage
 - vi. slope and adjustment

- vii. inductance
- viii. travel speed
- ix. wire feed speed
- x. penetration
- xi. travel and work angles
- xii. manipulation
- xiii. guide tubes
- xiv. contact tips
- xv. liners

3. Identify codes and standards pertaining to GMAW welding.
 - i. Canadian Standards Association (CSA)
 - ii. American Society of Mechanical Engineers (ASME)
 - iii. American Welding Society (AWS)
4. Identify GMAW welding equipment, consumables and accessories and describe their applications.
5. Describe the procedures used to assemble and disassemble GMAW welding equipment.
6. Describe the procedures used to establish and maintain an arc using GMAW welding equipment.
 - i. starting and stopping the weld
 - finishing end of the joint
 - ii. filler metal
 - iii. adjustment
 - iv. shielding gases (pre and post weld)
 - v. drive rolls
 - vi. gun
 - vii. stick-out
 - viii. speed
7. Identify the modes of transfer relating to GMAW welding and describe their characteristics and applications.
 - i. short circuiting
 - ii. globular
 - iii. spray
 - iv. pulse

8. Describe the procedures and techniques used to deposit a weld bead using GMAW welding equipment.
 - i. electrode extension
 - ii. travel speed
 - iii. work and travel angles
 - iv. flow rates
 - v. stringer
 - vi. weave
 - vii. stick-out
 - viii. travel speed
 - ix. work and travel angles
 - x. visual inspection
9. Describe the procedures used to inspect, maintain and troubleshoot GMAW welding equipment.

Practical Requirements:

1. Set-up GMAW equipment.
2. Change electrode wire guide.
3. Adjust and check flow meter.
4. Deposit fillet welds on mild steel, various thickness.
5. Perform a visual weld inspection.

WD1641 GTAW (Gas Tungsten Arc Welding) 1-Set-up and Deposit a Weld

Learning Outcomes:

- Demonstrate knowledge of gas tungsten arc welding (GTAW) equipment, consumables and accessories.
- Demonstrate knowledge of the procedures used to set-up, adjust, operate, inspect and maintain GTAW welding equipment.
- Demonstrate knowledge of the procedures used to deposit a weld bead using GTAW equipment.
- Demonstrate knowledge of the procedures used to perform visual weld inspections.

Duration: 18 Hours

Pre-Requisite(s): WD1190, WD1602

Objectives and Content:

1. Describe the purpose, applications and advantages of GTAW.
2. Define terminology associated with GTAW welding.
 - i. equipment and accessories
 - power sources
 - air-cooled torches
 - water-cooled torches
 - flow meters
 - ii. tungsten electrodes
 - iii. current requirement
 - iv. shielding gases
 - v. travel and work angles
 - vi. filler rods
 - vii. collet
 - viii. collet body
 - ix. cup
 - x. high frequency

3. Identify GTAW welding equipment, consumables and accessories and describe their applications.
4. Describe the procedures used to assemble and disassemble GTAW welding equipment.
5. Describe the procedures used to establish and maintain an arc using GTAW welding equipment.
6. Describe the procedures and techniques used to deposit a weld bead using GTAW welding equipment.
 - i. with filler metal
 - ii. without filler metal
7. Describe the procedures used to inspect, maintain and troubleshoot GTAW welding equipment

Practical Requirements:

1. Set-up GTAW equipment.
2. Run beads on mild steel plate.
3. Shut-down equipment.
4. Perform a visual weld inspection.

WD1651 Plasma Arc Cutting and Gouging

Learning Outcomes:

- Demonstrate knowledge of plasma arc equipment and accessories.
- Demonstrate knowledge of the procedures used to cut with plasma arc equipment.
- Demonstrate knowledge of the procedures used to gouge with plasma arc equipment.

Duration: 12 Hours

Pre-Requisite(s): WD1190

Objectives and Content:

1. Define terminology associated with plasma arc cutting and gouging.
2. Describe the plasma arc process.
 - i. general precautions
 - ii. equipment and accessories
 - types of torches
 - electrodes and tips
 - iii. types of arcs
 - iv. gases
 - v. power source
 - vi. procedures to set-up equipment and check its operation
3. Describe the procedures used to set-up, adjust and shut down plasma arc equipment.
4. Describe the procedures used to inspect and maintain plasma arc equipment.
5. Describe the procedures used to cut using plasma arc equipment.
6. Describe the procedures used to gouge using plasma arc equipment.

Practical Requirements:

1. Perform plasma arc cutting and gouging operations.

WD1661 Blueprint Reading 1 (Basic)

Learning Outcomes:

- Demonstrate a basic knowledge of blueprints and their purpose.
- Demonstrate knowledge of interpreting and extracting information from drawings.

Duration: 30 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Identify the types of orthographic, oblique and isometric drawings and their purposes.
2. Identify the various types of lines used on blueprints and describe their applications.
 - i. centre
 - ii. hidden
 - iii. dimension
 - iv. extension
 - v. object
 - vi. break
 - vii. long
 - viii. short
3. Identify views and describe their purpose.
 - i. front
 - ii. right side
 - iii. left side
 - iv. top (plan)
 - v. bottom
 - vi. back
 - vii. section
 - viii. detailed

4. Identify notes and specifications and describe their purpose.
 - i. parts of objects
 - ii. title block
 - iii. revisions
 - iv. drawing numbers
5. Identify sectioning practices and describe their purpose.
 - i. enlarged
 - ii. isometric
 - iii. auxiliary
 - iv. rotation
 - v. developed view
 - vi. detail
6. Identify and interpret common abbreviations and symbols.
 - i. supplementary symbols
 - ii. outdated and preferred symbols
 - iii. references
 - iv. location of symbols on drawings

Practical Requirement(s):

None.

WD1670 Blueprint Reading 2 (Welding Symbols)

Learning Outcomes:

- Demonstrate knowledge of the procedures used to interpret welding abbreviations and symbols.

Duration: 30 Hours

Pre-Requisite(s): WD1660

Objectives and Content:

1. Identify common welding symbols and abbreviations and describe their applications.
 - i. back gouging
 - ii. melt through
 - iii. finishing
 - iv. processes
2. Identify and interpret the symbols for fillet welds.
 - i. pitch
 - ii. dimension
 - iii. shape
 - iv. finishing
3. Identify and interpret the symbols for groove welds.
 - i. preparation
 - depth
 - angle
 - ii. root spacing
4. Identify and interpret the symbols for melt-through welds.
 - i. root spacing
 - ii. preparation angle
 - iii. backing
 - iv. fusible inserts
5. Identify and interpret the symbols for plug welds.
 - i. dimensions
 - ii. bevel angle
 - iii. filler thickness
 - iv. number

- v. pitch
- vi. shape

6. Identify and interpret weld finishing symbols.
 - i. grinding
 - ii. machining
 - iii. chipping
 - iv. hammering
 - v. rolling
 - vi. unspecified
7. Identify and interpret pipe welding symbols.

Practical Requirements:

1. Locate and interpret abbreviations and symbols relevant to the trade
 - i. fillet welds
 - ii. groove welds
 - iii. melt through
 - iv. weld finishing
 - v. plug welds

WD1682 Metallurgy

Learning Outcomes:

- Demonstrate knowledge of metals and their characteristics.
- Demonstrate knowledge of metallurgical principles.
- Demonstrate knowledge of expansion and contraction.

Duration: 18 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Define terminology associated with metallurgy.
 - i. ferrous
 - ii. low carbon
 - iii. medium carbon
 - iv. high carbon
 - v. alloy steel
 - vi. non-ferrous
 - vii. low alloy steel
 - viii. heat treated steel
 - ix. stainless steel
 - x. duplex stainless steel
 - xi. spark test
 - xii. tensile strength
 - xiii. elasticity
 - xiv. ductility
 - xv. hardness
 - xvi. compressive strength
 - xvii. fatigue strength
 - xviii. impact strength
 - xix. thermal conductivity
 - xx. thermal expansion
 - xxi. brittleness
 - xxii. forging process
 - xxiii. casting process
 - xxiv. peening
2. Describe classification numbering systems for metals.
 - i. Society of Automotive Engineers (SAE)
 - ii. American Iron and Steel Institute (ANSI)
 - iii. American Society of Testing and Materials (ASTM)
 - iv. Canadian Standards Association (CSA)

3. Identify the processes used in the heat treatment of metals.
 - i. stress relieving
 - ii. quenching
 - iii. hardening
 - iv. tempering
 - v. annealing
 - vi. normalizing

4. Describe the effects of hot and cold working of metals.
 - i. stress
 - ii. contraction
 - iii. expansion
 - iv. distortion
 - v. work hardening

Practical Requirements:

None.

WD1701 Stationary Machinery

Learning Outcomes:

- Demonstrate knowledge of stationary machinery, their applications, maintenance and procedures for use.

Duration: 12 Hours

Pre-Requisite(s): WD1190

Objectives and Content:

1. Define terminology associated with stationary machinery.
 - i. capacity
 - ii. rake angle
 - iii. blade clearance
 - iv. back gauge calibration
 - v. lateral guide squaring
 - vi. punching
 - vii. shearing
 - viii. notching
 - ix. coping
 - x. bending
2. Identify hazards and describe safe work practices pertaining to stationary machinery.
3. Identify types of stationary machinery and describe their characteristics and applications.
 - i. presses
 - ii. drill presses
 - iii. stationary grinders
 - iv. shears
 - v. saws
 - vi. press brakes
 - vii. ironworkers
 - viii. plate rollers

4. Describe the procedures used to set-up and operate stationary machinery.
5. Describe the procedures used to inspect and maintain stationary machinery.

Practical Requirements:

1. Set-up and operate stationary machinery.
 - i. punching
 - ii. notching
 - iii. shearing

WD1721 Jigs and Fixtures

Learning Outcomes:

- Demonstrate knowledge of basic jigs and fixtures and their applications.

Duration: 12 Hours

Pre-Requisite(s): WD1610 or WD1631 or WD1641 or WD1741 or WD1360

Objectives and Content:

1. Define terminology associated with jigs and fixtures.
2. Explain the purpose, applications and limitations of basic jigs and fixtures.
3. Identify types of basic jigs and fixtures and describe their characteristics and applications.
4. Describe the procedures used to fabricate basic jigs and fixtures.

Practical Requirements:

1. Fabricate a jig or fixture.

WD1730 Fabrication Fundamentals

Learning Outcomes:

- Demonstrate knowledge of structural components, their characteristics and applications.
- Demonstrate knowledge of joints, their applications and the procedures used to prepare them for welding operations.

Duration: 18 Hours

Pre-Requisite(s): SF1420

Objectives and Content:

1. Define terminology associated with structural components.
2. Identify hazards and describe safe work practices pertaining to structural components.
3. Interpret codes, regulations and standards pertaining to structural components.
 - i. industry standards
 - ii. codes of practice
 - iii. government regulations
4. Interpret information pertaining to structural components found on drawings and specifications.
5. Identify types of structures and describe their characteristics.
6. Identify structural steel shapes and describe their designations, characteristics and applications.
 - i. sheet
 - ii. plate
 - iii. pipe
 - iv. flat
 - v. bar
 - vi. angle
 - vii. channel
 - viii. beams
 - ix. hollow structural sections
7. Identify types of joints and describe their characteristics and applications.
 - i. corner
 - ii. tee

- iii. lap
- iv. edge
- v. butt

8. Describe the procedures used to prepare joints on structural steel shapes.
9. Describe the procedures used to fabricate using various structural steel shapes.

Practical Requirements:

None.

WD1741 FCAW (Flux Core Arc Welding) 1- Set-up and Deposit a Weld

Learning Outcomes:

- Demonstrate knowledge of flux core arc welding (FCAW) welding equipment, consumables and accessories.
- Demonstrate knowledge of the procedures used to set- up, adjust, operate, inspect and maintain FCAW welding equipment.
- Demonstrate knowledge of the procedures used to deposit a weld bead using FCAW welding equipment.
- Demonstrate knowledge of the procedures used to perform visual weld inspections.

Duration: 18 Hours

Pre-Requisite(s): WD1190, WD1602

Objectives and Content:

1. Describe the purpose, applications and advantages of FCAW.
2. Define terminology associated with FCAW welding.
 - i. general precautions
 - ii. equipment and accessories
 - shielding gas and regulators
 - electrode wire
 - flux cored
 - metal cored
 - gun
 - feeder
 - power source
 - nozzle
 - cable connections
 - cables
 - iii. metal transfers
 - iv. polarity
 - v. arc voltage
 - vi. slope and adjustment
 - vii. inductance

- viii. travel speed
- ix. wire feed speed
- x. penetration
- xi. travel and work angles
- xii. manipulation
- xiii. guide tubes
- xiv. contact tips
- xv. liners

3. Identify codes and standards pertaining to FCAW welding.
 - i. Canadian Standards Association (CSA)
 - ii. American Society of Mechanical Engineers (ASME)
 - iii. American Welding Society (AWS)
4. Identify FCAW welding equipment, consumables and accessories and describe their applications.
5. Describe the procedures used to assemble and disassemble FCAW welding equipment.
6. Describe the procedures and techniques used to deposit a satisfactory weld.
 - i. starting and stopping the weld
 - ii. filler metal
 - iii. adjustment
 - iv. shielded gases (pre and post weld)
 - v. drive rolls
 - vi. gun
 - vii. stick-out
 - viii. speed
7. Describe the procedures used to inspect, maintain and troubleshoot FCAW welding equipment.

Practical Requirements:

1. Set-up FCAW equipment, establish and maintain an arc.
2. Perform a visual weld inspection.

WD1815 Fillet and Groove Weld, Medium and High Carbon Steel using FCAW, GMAW, GTAW, MCAW and SMAW

Learning Outcomes:

- Demonstrate knowledge of the procedures used to prepare medium and high carbon steel plate and joints for FCAW, GMAW, GTAW, MCAW and SMAW fillet and groove welds.
- Demonstrate knowledge of the procedures used to perform fillet and groove welds on medium and high carbon steel plate in all positions using the FCAW, GMAW, GTAW, MCAW and SMAW processes.

Duration: 6 Hours

Pre-Requisite(s): WD1610 or WD1631 or WD1641 or WD1741 or WD1360

Objectives and Content:

1. Define terminology associated with FCAW, GMAW, GTAW, MCAW and SMAW fillet and groove welds on medium and high carbon steel plate.
2. Identify the considerations when selecting consumables and determining equipment set-up for performing FCAW, GMAW, GTAW, MCAW and SMAW fillet and groove welds on medium and high carbon steel plate.
 - i. specification requirements
 - ii. base metals
 - composition
 - thickness
 - iii. power source
 - iv. welding position
 - v. joint type and design
3. Identify the requirements and describe the procedures to store consumables used for FCAW, GMAW, GTAW, MCAW and SMAW fillet and groove welds on medium and high carbon steel plate.

4. Describe the procedures used to prepare medium and high carbon steel plate and joints for FCAW, GMAW, GTAW, MCAW and SMAW fillet and groove welds.
5. Describe the procedures used to perform fillet and groove welds on medium and high carbon steel plate using FCAW, GMAW, GTAW, MCAW and SMAW processes.
 - i. temperature measuring devices
 - ii. pre-heating
 - iii. interpass temperature
 - iv. post-heating
 - v. stress relieving
6. Describe the procedures used to prevent and correct weld faults.

Practical Requirements:

None.

WD1832 GMAW (Gas Metal Arc Welding) 3-Groove Weld, All Positions, Mild Steel

Learning Outcomes:

- Demonstrate knowledge of the procedures used to prepare base metals and joints for gas metal arc welding (GMAW) groove welds.
- Demonstrate knowledge of the procedures used to perform groove welds on mild steel plate in all positions using the GMAW process.
- Demonstrate knowledge of the procedures used to perform visual weld inspections.

Duration: 30 Hours

Pre-Requisite(s): WD1821

Objectives and Content:

1. Define terminology associated with GMAW groove welds.
2. Identify the considerations when selecting consumables and determining equipment set-up for performing GMAW fillet and groove welds on mild steel plate.
 - i. specification requirements
 - ii. base metals
 - composition
 - thickness
 - iii. power source
 - iv. welding position
 - v. joint type and design
3. Identify the requirements and describe the procedures to store consumables used for GMAW groove welds on mild steel plate.
4. Describe the procedures used to prepare base metal and joints for GMAW groove welds.

5. Describe the procedures used to perform groove welds on mild steel plate in all positions using GMAW process.
6. Describe the procedures used to prevent and correct weld faults.
7. Perform groove welds on mild steel plate in all positions.

Practical Requirements:

1. Perform groove welds in flat, horizontal, and vertical down positions on mild steel plate using the GMAW process.
2. Perform a visual weld inspection.

WD1430 Hoisting, Lifting, Rigging and Access Equipment

Learning Outcomes:

- Demonstrate knowledge of hoisting, lifting, rigging and access equipment, their applications, limitations and procedures for use.
- Demonstrate knowledge of the procedures used to perform hoisting and lifting operations.
- Demonstrate knowledge of calculations required prior to hoisting and lifting operations.

Duration: 30 Hours

Pre-Requisite(s): WD1390

Objectives and Content:

1. Define terminology associated with hoisting, lifting, rigging and access equipment.
2. Identify hazards and describe safe work practices pertaining to hoisting, lifting rigging and access equipment.
3. Identify regulations pertaining to hoisting, lifting rigging and access equipment.
4. Identify types of access equipment and describe their characteristics and applications.
 - i. scaffolding
 - ii. ladders
 - iii. man lifts
 - iv. elevated work platforms
5. Identify types of fall protection and fall arrest equipment and describe their applications and procedures for use.
6. Identify types of rigging equipment and accessories and describe their limitations, applications and procedures for use.

7. Identify types of hoisting and lifting equipment and accessories and describe their applications and procedures for use.
 - i. jacks
 - ii. hoists
 - iii. cranes
 - overhead travelling cranes (OTC)
 - gantry
8. Describe the procedures used to inspect, maintain and store hoisting, lifting, rigging and access equipment.
9. Describe the procedures used to rig material/equipment for lifting.
10. Describe the procedures to attach and use tag lines.
11. Describe the procedures used to ensure the work area is safe for lifting.
 - i. supervision of lift
 - ii. securing work area
 - iii. communication
12. Identify and describe the procedures used to communicate during hoisting, lifting and rigging operations.
 - i. hand signals
 - ii. electronic communications
 - iii. audible and visual warnings
13. Identify the factors to consider when selecting rigging equipment.
 - i. load characteristics
 - ii. sling angle
 - iii. environment
 - chemical hazards
 - grounding requirements
 - weather conditions
 - iv. working load limit
14. Describe the procedures used to perform a lift.
 - i. pre-lift checks
 - ii. lifting load

- iii. placement of load
- iv. post-lift inspection

Practical Requirements:

None.

WD1761 Air-Arc Cutting and Gouging

Learning Outcomes:

- Demonstrate knowledge of the procedures used to remove a weld from a joint using the AAC process
- Demonstrate knowledge of the procedures used to cut metal using the AAC process

Duration: 9 Hours

Pre-Requisite(s): WD1270

Objectives and Content:

1. Identify the equipment and accessories used in the AAC process.
 - i. power source
 - ii. torch
 - iii. ground clamp
 - iv. air supply
 - v. pressure regulator
 - vi. electrodes
 - vii. cables
2. Describe the AAC process and its applications.
 - i. cut
 - ii. remove faulty welds
 - iii. joint preparation
 - iv. back gouge

Practical Requirements:

1. Remove a weld from a joint using the AAC process.
2. Cut Metal using the AAC process.

WD1770 Submerged Arc Welding Set-up

Learning Outcomes:

- Demonstrate knowledge of the SAW process.

Duration: 4 Hours

Pre-Requisite(s): WD1270

Objectives and Content:

1. Describe the procedures used to weld carbon steel plate of various thicknesses using the SAW process.
 - i. deposition rates
 - ii. travel speeds
 - iii. depth of penetration
 - iv. welding position
 - v. fluxes
 - vi. starting methods
 - vii. faults encountered

Practical Requirements:

None.

WD2410 Stud and Spot Resistance Welding

Learning Outcomes:

- Demonstrate knowledge of stud welding and resistance spot welding.

Duration: 4 Hours

Pre-Requisite(s): WD1620

Objectives and Content:

1. Define terminology associated with the stud weld and resistance spot weld process.
2. Describe the stud weld process.
 - i. general precautions
 - ii. principles of operation
 - equipment
 - weld quality
 - variables
 - stud size
 - current
 - time
3. Describe the procedures used to stud weld.

4. Describe the resistance spot weld process.
 - i. general precautions
 - ii. principles of operation
 - equipment
 - weld quality
 - types of joints
 - variables
 - current
 - time
 - material (type and thickness)
5. Describe the procedures used to perform resistance spot weld.

Practical Requirements:

None.

SF1140 Blueprint reading (shop drawings)

Learning Outcomes:

- Demonstrate knowledge of interpreting and extracting information from structural steel, tanks, tank erections, pressure vessel shop drawings
- Demonstrate knowledge of interpreting and extracting information from basic piping drawings.

Duration: 30 Hours

Pre-Requisite(s):

Objectives and Content:

1. Define terminology associated with structural steel, tanks, and pressure vessel shop and erection drawings.
2. Identify symbols and abbreviations found on structural steel, tanks, and pressure vessel shop and erection drawings.
3. Interpret information found on structural steel shop and erection drawings.
4. Interpret information found on tank shop and erection drawings.
5. Interpret information found on pressure vessel shop drawings.
6. Interpret information found on basic piping drawings.

Practical Requirements:

1. Draw template for structural parts.

SF1400 Press Brake Operation

Learning Outcomes:

- Demonstrate knowledge of the procedures used to bend sheet and plate using a press brake.
- Demonstrate knowledge of the procedures used to layout materials in preparation for bending.
- Demonstrate knowledge of the procedures used to perform operational adjustments and corrective maintenance.

Duration: 45 Hours

Pre-Requisite(s): SF1460

Objectives and Content:

1. Identify types of press brakes and describe their applications.
 - i. hydraulic
 - ii. mechanical
 - iii. Computerized Numerical Control (CNC)
2. Describe the set-up of press brake machinery.
 - i. attachments
 - ii. adjustments
 - iii. machine capabilities
 - sheet
 - plate
 - ferrous and non-ferrous
3. Describe the procedures used to layout materials for bending on a press brake.
 - i. allowances
 - future operations
 - bending
 - ii. dies and jigs
 - iii. bending charts
 - iv. bending sequence

4. Describe operational maintenance of press brake equipment.

Practical Requirements:

1. Set-up press brake.
2. Layout materials in preparation for bending.
3. Bend sheet and plate using a press brake, as per blueprint.
4. Perform operational adjustments and corrective maintenance.

SF1410 Roll Forming Equipment and Operation

Learning Outcomes:

- Demonstrate knowledge of the procedures used to roll ferrous and non-ferrous plate, sheet and structural shapes to specified dimensions.
- Demonstrate knowledge of attachments used with roll forming equipment.
- Demonstrate knowledge of the procedures used to perform maintenance to roll forming equipment.

Duration: 45 Hours

Pre-Requisite(s): WD1185

Objectives and Content:

1. Describe the procedures used to set-up roll forming equipment.
2. Describe operation of equipment for:
 - i. roll configuration
 - ii. pre-bend
 - iii. capacity
 - iv. template
 - over roll
 - under roll
3. Describe the procedures used to roll ferrous and non-ferrous plate, sheet and structural shapes to specified dimensions.
 - i. equipment selection
 - ii. effects of rolling on material
4. Identify types of attachments and describe their applications, installation and adjustment.
 - i. cone rolling
 - ii. flat bar rolling
 - iii. angle rolling

5. Describe maintenance of roll forming equipment.

Practical Requirements:

1. Set-up plate rolling equipment.
2. Roll mild steel plate as per blueprint.

SF1150 Layout Introduction and Parallel Line Development

Learning Outcomes:

- Demonstrate knowledge of basic layout operations.
- Demonstrate knowledge of the procedures used to perform a simple sketch.
- Demonstrate knowledge of the procedures used to perform basic parallel line development.

Duration: 40 Hours

Pre-Requisite(s): WD1660

Objectives and Content:

1. Describe methods used to carry out basic layout operations.
2. Describe geometric operations used in performing layout.
 - i. bisecting lines and circles
 - ii. erecting perpendiculars
 - iii. dividing lines and circles
 - iv. trisecting angles
 - v. drawing a tangent from a given point
 - vi. constructing a pentagon
 - vii. constructing a hexagon
 - viii. constructing an octagon
 - ix. drawing an ellipse
 - x. drawing a spiral/helix
3. Describe the procedures to perform a simple sketch.
4. Describe terminology associated with parallel line development.
5. Describe the purpose of parallel line development.
6. Describe cylinders with various mitre cuts.
 - i. use of views
 - ii. methods of development
 - iii. elements
 - iv. pattern of development
7. Describe two, three, four and five piece elbows.
 - i. elbow rule
 - ii. types of patterns
 - iii. necessary view

- iv. pattern development
8. Describe layout to provide for bending of flat surfaces at various angles.
9. Describe development of pipe or tubing tee.
 - i. equal and unequal diameters
 - ii. unequal diameter with branch placed off centre
 - iii. method of establishing mitre lines (line of cut)
 - iv. pattern development

Practical Requirements:

1. Perform layout operations.
2. Perform basic parallel line development as per job sheet.

SF1160 Radial & Triangulation Layout

Learning Outcomes:

- Demonstrate knowledge of the procedures used to perform radial line development.
- Demonstrate knowledge of the procedures used to use radial line layout in combination with other layout methods.
- Demonstrate knowledge of the procedures to use triangulation to develop patterns.
- Demonstrate knowledge of the procedures to use triangulation layout in combination with other layout methods.

Duration: 50 Hours

Pre-Requisite(s): SF1150

Objectives and Content:

1. Define terminology associated with radial line & triangulation development.
2. Describe the purpose of radial line development & triangulation.
3. Describe development of conical sections.
 - i. plane through cone 90° to axis of circle
 - ii. plane through both sides inclined to the axis of an ellipse
 - iii. plane through apex of a cone vertically to the base triangle
 - iv. plane through a cone parallel to the apex in a hyperbola
 - v. plane through a cone parallel to its sides in a parabola
4. Describe the process to draw a truncated cone.
 - i. concentric
 - ii. eccentric
5. Describe development of a round cylinder intersecting a cone at 90° .
 - i. intersecting radial line to parallel line
6. Describe true length lines.
 - i. use of plan and elevation to determine true lengths
 - ii. numbering and lettering
7. Describe development of transitional concentric and eccentric shapes.
 - i. square to square
 - ii. square to rectangular
 - iii. square to round

Practical Requirements:

1. Perform basic radial line development as per job sheet.
2. Perform basic triangulation development as per job sheet.

SF1460 Basic Plate Development

Learning Outcomes:

- Demonstrate knowledge of the procedures used to lay out basic cylinders, cones, hoppers and chutes.
- Demonstrate knowledge of the procedures to use plate development in combination with other layout methods.

Duration: 120 Hours

Pre-Requisite(s): SF1450

Objectives and Content:

1. Describe the purpose of plate development.
2. Identify types of cylinders and describe their applications.
 - i. small shop fabricated
 - ii. large field assembled
3. Interpret drawings and identify material type and size of cylinder.
4. Describe cylinder development.
 - i. interpret the drawing
 - inside diameter
 - outside diameter
 - mean diameter
 - ii. check materials
 - iii. stretch-out of plate material
 - iv. preparation of plate for layout
 - squaring up
 - marking-out in preparation for beveling
 - reason for roll up or roll down
 - mark out for assembly holes
5. Describe cones and development of conical shapes.
 - i. interpret the drawing

- ii. check materials
- iii. method of development
 - one piece cone
 - two half sections
- iv. layout methods
 - plate thickness allowance
 - calculation of true lengths
 - marking out radial lines
 - prepare plate edges for welding or bolting
 - mark up plates for bending
 - prepare bending templates
 - use template to check accuracy of contours

6. Identify hoppers and describe their applications.

- i. small shop fabricated
- ii. simple square
- iii. simple rectangular

7. Interpret drawings and identify material type and size of hopper.

8. Describe layout for plate development of hoppers and chutes.

- i. thickness of plate
- ii. bending allowance
- iii. calculation of true lengths
- iv. bevels and angles
- v. establish work and bend lines
- vi. make bending templates
- vii. marking of material
- viii. bolt hold pattern

Practical Requirements:

1. Lay out and fabricate basic shapes as per job sheet.
2. Lay out and fabricate basic hoppers.

SF1470 Basic Assembly and Fitting

Learning Outcomes:

- Demonstrate knowledge of the procedures used to fit and assemble basic shop and field units.
- Demonstrate knowledge of common accessories and related equipment.

Duration: 40 Hours

Pre-Requisite(s): SF1420

Objectives and Content:

1. Define terminology associated with assembly and fitting.
2. Identify common accessories used to assemble and fit components and describe their applications.
 - i. dogs
 - ii. wedges
 - iii. clips
 - iv. angles
 - v. tie-down plates
 - vi. spider jigs
3. Describe the procedures used to fit-up and assemble:
 - i. small units
 - ii. large units
 - iii. large units to be disassembled for field erection
4. Describe the procedures to layout and fit complex beams and columns.
 - i. interpret drawings
 - ii. check bill of materials and mill certificate
 - iii. determine layout
 - iv. check gauges
 - v. block outs
 - vi. copes
 - vii. clearances
 - viii. mark up
 - ix. back check of work

Practical Requirements:

1. Fabricate beams and columns as per blueprint instructions.

AM1000 Introduction to Essential Skills

Learning Outcomes:

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

Duration: 9 Hours

Pre-Requisite(s): None

Objectives and Content:

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

- iv. wage & job advancement

Practical Requirements:

1. Complete an essential skills self-assessment addressing numeracy, document use and reading. The online **Government of Canada Essential Skills Indicator⁴** and **Essential Skills Self-Assessment for the Trades⁵** are to be used unless the instructor provides a similar assessment tool or tools.
2. Participate in a group discussion about the impact of gaps in essential skills that may be revealed by the self-assessments completed, and the value of improving essential skills.

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

Resources:

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

AM1101 Math Essentials

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

Learning Outcomes:

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

Duration: 42 Hours

Pre-Requisite(s): None

Objectives and Content:

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

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

- ii. use a proportion comparing two ratios

8. Describe the use of the imperial measurement system in math problems.

- i. identify units of measurement
 - length
 - mass
 - area
 - volume
 - capacity

9. Describe the use of the metric measurement system in math problems.

- i. identify units of measurement
 - length
 - mass
 - area
 - volume
 - capacity

10. Identify angles, lines and geometric shapes.

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

11. Describe estimation strategies.

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

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

Practical Requirements:

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

AM1231 Metal Fabrication Math Fundamentals

Learning Outcomes:

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

Duration: 42 Hours

Pre-Requisite(s): AM1101

Objectives and Content:

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

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

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

Practical Requirements:

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

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

CM2161 Communication Essentials

Learning Outcomes:

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

Duration: 36 Hours

Pre-Requisite(s): None

Objectives and Content:

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

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

- ii. common trade specific forms
- iii. primary and secondary methods of information gathering
- iv. accuracy and completeness in reports and forms

5. Demonstrate an understanding of interpersonal communications in the workplace.

- i. recognize group dynamics
- ii. contribute information and expertise
- iii. individual learning styles
 - audible
 - visual
 - experiential
 - theoretical
- iv. recognize respectful and open communication
- v. accept and provide feedback
- vi. interpret non-verbal communication cues
 - body language
 - signals

6. Demonstrate an understanding of effective oral communication skills.

- i. listening
 - receiving, understanding, remembering, reflecting, evaluating, paraphrasing, and responding
- ii. speaking
 - using clear and proper words
 - tone, style, and vocabulary
 - brevity
- iii. common workplace oral communication situations
 - introducing self and others
 - telephone conversations
 - tool box/safety talks
 - face-to-face conversations
 - communicating with co-workers, supervisors, clients, and other trades people

7. Identify common practices related to workplace meetings.

- i. meeting formats
- ii. meeting preparation
- iii. agendas and minutes
- iv. roles, responsibilities, and etiquette of meeting participants

8. Identify acceptable workplace use of communication technologies

- i. cell / smart phone etiquette
- ii. voice mail
- iii. e-mail
- iv. texting / messaging through social media

- v. teleconferencing / videoconferencing for meetings and interviews
- vi. social networking
- vii. other emerging technologies

9. Demonstrate an understanding of effective job search techniques

- i. employment trends, opportunities, and sources of employment
- ii. job ads and the importance of fitting qualifications to job requirements
- iii. resumes
 - characteristics of effective resumes
 - types of resumes
 - principles of resume formatting
- iv. effective cover letters
- v. job interview process
 - pre-interview preparation
 - interview conduct
 - post-interview follow up

Practical Requirements:

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

SD1761 Workplace Essentials

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

Learning Outcomes:

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

Duration: 24 Hours

Pre-Requisite(s): None

Objectives and Content:

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

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

4. Demonstrate an understanding of worker's rights.
 - i. labour standards
 - ii. regulations, including:
 - hours of work & overtime
 - termination of employment
 - minimum wages & allowable deductions
 - statutory holidays, vacation time, and vacation pay
5. Demonstrate an understanding of human rights issues.
 - i. awareness of the Human Rights Code and the role of the Human Rights Commission
 - ii. categories of discrimination and strategies for prevention
 - direct
 - systemic
 - adverse effect
 - iii. types of discrimination
 - race
 - ethnic origin
 - colour
 - religion
 - age
 - gender identify
 - sexual orientation
 - marital status
 - family status
 - disability
 - criminal conviction that has been pardoned
 - iv. conduct that constitutes harassment and discrimination
 - objectionable conduct
 - comments or displays made either on a one-time or continuous basis that demeans, belittles, or causes personal humiliation or embarrassment to the recipient
 - v. the value of diversity in the workplace
 - culture
 - gender identify
 - sexual orientation

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

Practical Requirements:

None.

MC1062 Computer Essentials

Course Outcomes:

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

Duration: 15 Hours

Pre-Requisite(s): None

Objectives and Content:

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

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

4. Identify the skills necessary to perform file management commands.
 - i. create folders
 - ii. copy files and folders
 - iii. move files and folders
 - iv. rename files and folders
 - v. delete files and folders
5. Describe the use of word processing software to create documents.
 - i. enter & edit text
 - ii. indent and tab text
 - iii. change text attributes
 - bold
 - underline
 - font
 - iv. change layout format
 - margins
 - alignment
 - line spacing
 - v. spell check and proofread
 - vi. save, close & reopen a document
 - vii. print document
6. Describe the use of spreadsheet software to create documents.
 - i. enter data in cells
 - ii. format data in cells
 - iii. create formulas to add, subtract, multiply and divide
 - iv. save, close & reopen a spreadsheet
 - v. print spreadsheet
7. Describe the use of the internet in the workplace.
 - i. web browsers
 - ii. search engines
 - iii. security issues
 - iv. personal responsibility for internet use at work
8. Describe the role of e-mail.
 - i. e-mail etiquette
 - grammar and punctuation
 - privacy issues when sharing and forwarding e-mail
 - work appropriate content
 - awareness of employer policies
 - ii. managing e-mail
 - using folders
 - deleting, forwarding, replying
 - iii. adding attachments to e-mail
 - iv. view e-mail attachments

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

Practical Requirements:

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

AP1102 Introduction to Apprenticeship

Learning Outcomes:

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

Duration: 12 Hours

Pre-Requisite(s): None

Objectives and Content:

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

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

- ii. the Red Seal Occupational Standard (RSOS)
- iii. relationship of RSOS to Red Seal examination
- iv. national qualification recognition and mobility

8. Identify the current financial incentives available to apprentices.

- i. Federal
- ii. Provincial

9. Explain the Provincial / Territorial Apprentice Mobility Guidelines.

- i. temporary mobility
- ii. permanent mobility

10. Describe Atlantic and National Harmonization initiatives.

Practical Requirements:

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

C. Conditions Governing Apprenticeship Training

1.0 General

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

2.0 Entrance Requirements

2.1 Entry into the occupation as an apprentice requires:

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

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

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

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

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

3.0 Probationary Period

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

4.0 Termination of a Memorandum of Understanding

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

5.0 Apprenticeship Progression Schedule, Wage Rates and Advanced Training Criteria

Progression Schedule

Metal Fabricator (Fitter) – 5400 Hours			
Apprenticeship Level and Wages			
Level	Wage Rate	Requirements for Progression to Next Level	Next Level
1 st	60 %	<ul style="list-style-type: none"> ▪ Completion of pre-employment training ▪ Registration as an apprentice ▪ Minimum 1800 hours of combined relevant work experience and training 	2 nd Year
2 nd	75%	<ul style="list-style-type: none"> ▪ Completion of AACS Level 2 training ▪ Pass Level 2 exam ▪ Minimum 3600 hours of combined relevant work experience and training 	3 rd Year
3 rd	90%	<ul style="list-style-type: none"> ▪ Completion of AACS Level 3 training ▪ Pass Level 3 exam ▪ Minimum 5400 hours of combined relevant work experience and training ▪ Sign-off of all workplace skills in apprentice logbook ▪ Pass certification exam 	Journeyperson Certification
<p>Wage Rates</p> <ul style="list-style-type: none"> ▪ Rates are percentages of the prevailing journeyperson's wage rate in the place of employment of the apprentice. ▪ Rates must not be less than the wage rate established by the Labour Standards Act (1990), as now in force or as hereafter amended, or by other order, as amended from time to time replacing the first mentioned order. ▪ Rates must not be less than the wage rate established by any collective agreement which may be in force at the apprentice's workplace. ▪ Employers are free to pay wage rates above the minimums specified. 			
<p>Level Exams</p> <ul style="list-style-type: none"> ▪ This program may not currently contain Level Exams, in which case this requirement will be waived until such time as Level Exams are available. 			

Metal Fabricator (Fitter) – 5400 Hours		
Class Calls (After Apprenticeship Registration)		
Call Level	Requirements for Class Call	Hours awarded for In-School Training
Direct Entry Level I	<ul style="list-style-type: none">▪ Minimum of 1800 hours of relevant work experience	270
Level 2	<ul style="list-style-type: none">▪ Minimum of 3000 hours of relevant work experience and training	240
Level 3	<ul style="list-style-type: none">▪ Minimum of 5200 hours of relevant work experience and training	180
Class Calls at Minimum Hours		
<ul style="list-style-type: none">▪ Class calls may not always occur at the minimum hours indicated. Some variation is permitted to allow for the availability of training resources and apprentices.		

6.0 Tools

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

7.0 Periodic Examinations and Evaluation

- 7.1 Every apprentice shall submit to such occupational tests and examinations as the PACB shall direct. If after such occupational tests and examinations the apprentice is found to be making unsatisfactory progress, his/her apprenticeship level and rate of wage shall not be advanced as provided in Section 5 until his/her progress is satisfactory to the Director of Apprenticeship and Trades Certification and his/her date of completion shall be deferred accordingly. Persistent failure to pass required tests shall be a cause for revocation of his/her Memorandum of Understanding.
- 7.2 Upon receipt of reports of accelerated progress of the apprentice, the PACB may shorten the term of apprenticeship and advance the date of completion accordingly.
- 7.3 For each and every course, a formal assessment is required for which 70% is the pass mark. A mark of 70% must be attained in both the theory examination and the practical project assignment, where applicable as documented on an official transcript.
- 7.4 Course credits may be granted through the use of a PACB approved matrix which identifies course equivalencies between designated trades and between current and historical Plans of Training for the same trade.

8.0 Granting of Certificates of Apprenticeship

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

9.0 Hours of Work

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

10.0 Copies of the Registration for Apprenticeship

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

11.0 Ratio of Apprentices to Journeypersons

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

12.0 Relationship to a Collective Bargaining Agreement

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

13.0 Amendments to a Plan of Apprenticeship Training

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

14.0 Employment, Re-Employment and Training Requirements

- 14.1 The Plan of Training requires apprentices to regularly attend their place of employment.
- 14.2 The Plan of Training requires apprentices to attend training for that occupation as prescribed by the PACB.
- 14.3 Failure to comply with Sections 14.1 and/or 14.2 will result in cancellation of the Memorandum of Understanding. Apprentices may have their MOUs reinstated by the PACB but would be subject to a commitment to complete the entire program as outlined in the General Conditions of Apprenticeship. Permanent cancellation in the said occupation is the result of non-compliance.
- 14.4 Cancellation of the Memorandum of Understanding to challenge journeyperson examinations, if unsuccessful, would require an apprentice to serve a time penalty of two (2) years before reinstatement as an apprentice or qualifying to receive a class call to training as a registered Trade Qualifier. Cancellation must be mutually agreed upon by the employer and the apprentice.

- 14.5 An employer shall ensure that each apprentice is under the direct supervision of an approved journeyperson supervisor who is located at the same worksite as the apprentice, and that the apprentice is able to communicate with the journeyperson with respect to the task, activity or function that is being supervised.
- 14.6 Under the Plan of Training the employer is required to keep each apprentice employed as long as work is available, and if the apprentice is laid off due to lack of work, to give first opportunity to be hired before another is hired.
- 14.7 The employer will permit each apprentice to attend training programs as prescribed by the PACB.
- 14.8 Apprentices who cannot acquire all the workplace skills at their place of employment will have to be evaluated in a simulated work environment at a PACB authorized training institution and have sign-off done by instructors to meet the requirements for certification.

15.0 Appeals to Decisions Based on Conditions Governing Apprenticeship Training

Persons wishing to appeal any decisions based on the above conditions must do so in writing to the Minister of Education and Early Childhood Development within 30 days of the decision.

D. Requirements for Red Seal Endorsement

1. Evidence the required work experiences outlined in this Plan of Training have been obtained. This evidence must be in a format clearly outlining the experiences and must be signed by an appropriate person or persons attesting that these experiences have been obtained to the level required.
2. Successful completion of all required courses in the program.
3. A combination of training from an approved training program and suitable work experience totaling 5400 hours.

Or

A total of 8100 hours of suitable work experience.

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

E. Roles and Responsibilities of Stakeholders in the Apprenticeship Process

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

The Apprentice:

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

The Employer:

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

The Training Institution:

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

The Apprenticeship and Trades Certification Division:

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

The Provincial Apprenticeship and Certification Board:

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

Department of Education and Early Childhood Development
Apprenticeship and Trades Certification Division

