

Pre-Employment Plan of Training



PLAN OF TRAINING

Automotive Service Technician

March, 2019



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

Approved by:

A handwritten signature in blue ink that appears to read "Dave L." followed by a period.

Chairperson, Provincial Apprenticeship and Certification Board

Date: March 20, 2019

Preface

This curriculum standard is aligned with the 2019 Level 1 Atlantic Apprenticeship Curriculum Standard (AACs) and the 2016 Red Seal Occupational Standard (RSOS) for the Automotive Service Technician trade. It describes the curriculum content for the Automotive Service Technician Pre-Employment training program.

Acknowledgements

Advisory committees, industry representatives, instructors and apprenticeship staff provided valuable input to the development of this Pre-Employment curriculum standard. Without their dedication to quality training, this document could not have been produced.

We offer a sincere thank you.

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Plan of Training - Automotive Service Technician

Document Status	Date distributed	Mandatory Implementation Dates	Comments
New	March 2019	September 2019 – Pre-Employment	AACS and RSOS alignment
Approved	June 2020		Updated Essential Skills courses to 2019 versions. Applied accessibility formatting.

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A. RSOS Comparison Chart

A Red Seal Occupational Standard (RSOS) 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 can be determined by the educational agency, as long as pre-requisite conditions are satisfied.

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

Courses with an identified AACS number are equivalent to Level 1 units (courses) in the AACs.

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

Pre-Employment				
Course No.	AACS No.	Course Name	Hours	Pre-Requisite(s)
TS1510	AST-100	Occupational Health and Safety	6	None
TS1520	AST-100	WHMIS	6	None
TS1530	-	Standard First Aid	14	None
SV1105	AST-100	Safety in the Shop	12	None
SV1165	AST-105 AST-130	Hand Tools	30	SV1105
SV1177	AST-105 AST-115	Shop Tools and Equipment	24	SV1165
SV1188	AST-110	Fasteners, Tubing and Fittings	14	SV1177
SV1158	AST-125 AST-165	Service Information Systems and Trade Related Documents	16	SV1177
SV1217	AST-130	Tires, Wheels and Hubs	24	SV1177 SV1642
SV1552	AST-155 AST-170	Body Components, Accessories and Trim	20	SV1177
SV1256	AST-145	Suspension I	48	SV1177
SV1228	AST-150	Steering Systems	64	SV1177

Pre-Employment				
Course No.	AACS No.	Course Name	Hours	Pre-Requisite(s)
SV1642	AST-160	Braking Systems I (Non-ABS)	60	SV1177
SV1132	AST-165	Introduction to Electrical and Electronic Principles	90	SV1177
SV1377	AST-165	Batteries	18	SV1177
SV1287	AST-155	Drive Shafts and Axle Shafts	30	SV1177
SV1306	AST-175	Engine Principles (Gasoline and Diesel)	90	SV1177
SV1600	-	Ignition Systems	30	SV1377
SV1387	-	Introduction to Starting Systems	30	SV1377
SV1396	-	Introduction to Charging Systems	30	SV1377
SV1311	-	Introduction to Cooling Systems	30	SV1177
SV1197	-	Lubrication and Fluids Servicing	24	SV1177
SV1691	-	Introduction to Accessory Drive Systems	18	SV1177
SV1681	AST-125 AST-180	Preventative Vehicle Maintenance Inspections (PMI)	24	SV1177 SV1197
SV1700	-	Hybrid Systems I	24	SV1177 SV1377
SV1125	-	Gaskets, Seals and Bearings	30	None
WD1301	AST-105 AST-135	Oxy-Fuel Welding/Cutting	30	SV1177
SV1710	AST-105 AST-140	Gas Metal Arc Welding (GMAW [MIG])	30	SV1177
SV2282	AST-185	Pre-Delivery Inspection	18	SV1681
AM1000	-	Introduction to Essential Skills	9	None
AM1101	-	Math Essentials	42	None
AM1221	-	Automotive Service 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 Pre-Employment Hours			1064	

Required Work Experience

*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 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

Objectives and Content:

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

SV1105 Safety in the Shop

Learning Outcomes:

- Demonstrate knowledge of various types of shop hazards.
- Demonstrate knowledge of safe work practices
- Demonstrate knowledge of regulatory requirements pertaining to safety.
- Demonstrate knowledge of PPE their applications, limitations and procedures for use.
- Demonstrate knowledge of safety equipment their applications and procedures for use.
- Demonstrate knowledge of safety protocols for hybrid and electric vehicles (EV).

Duration: 12 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Identify various safety hazards.
 - i. fire hazards
 - classification of fire types
 - purpose and use of fire extinguishers
 - ii. explosion hazards
 - detection and prevention
 - spontaneous combustion
 - storage and handling of fuels
 - iii. hazardous gases
 - refrigerants
 - carbon monoxide
 - ventilation
 - storage and handling of batteries
2. Identify types of PPE and describe their applications and limitations for use.
3. Describe the care and maintenance of PPE.
4. Identify types of shop safety equipment and describe their applications.
5. Describe the care and maintenance of shop safety equipment.

6. Describe safe work practices to maintain a safe work environment.
 - i. personal
 - ii. shop/facility
 - fire
 - explosion
 - gases
 - iii. environmental awareness
 - iv. vehicle
 - refrigerant systems
 - restraint systems
 - high voltage systems (hybrid and EV systems)
 - high pressure fuel systems
7. Identify and describe jurisdictional requirements for handling and disposing of hazardous materials.
8. Identify workers' rights regarding safety.
 - i. Workers Compensation Act

Practical Requirements:

1. Locate exits, fire alarms.
2. Locate MSDS sheets; manual and electronic copies.
3. Locate shop ventilation systems.
4. Prepare a floor plan showing fire exit routes.

SV1165 Hand Tools

Learning Outcomes:

- Demonstrate knowledge of the procedures used to select, use and maintain various cutting and non-cutting hand tools.
- Demonstrate knowledge of measuring and testing devices, their applications, maintenance and procedures for use.

Duration: 30 Hours

Pre-Requisite(s): SV1105

Objectives and Content:

1. Describe safe operating procedures for hand tools.
2. Describe the procedures to select, use, maintain and store non-cutting hand tools.
 - i. screwdrivers
 - standard
 - Phillips
 - Robertson
 - Torx
 - ii. pliers
 - combination
 - gripping
 - cutting
 - vise-grips
 - snap ring
 - needle nose
 - iii. special hose clamp tools
 - iv. wrenches
 - open-end
 - box ends
 - ratcheting box ends
 - flex-head box ends
 - obstruction wrenches
 - special-purpose box wrenches
 - adjustable wrenches
 - pipe wrenches
 - spanner wrenches
 - Allen and multi-spline wrenches (recognition of sizes – metric and

- imperial)
- v. sockets and drives (recognition of sizes – metric and imperial)
 - drive sizes
 - socket points
 - deep sockets
 - flexible sockets
 - drive handles
 - speed handles
 - ratchets
 - universal joints
 - adapters
 - extensions
- vi. hammers
 - ball peen
 - cross peen
 - plastic tip
 - brass-headed
 - rubber mallets
 - dead blow
 - sledgehammers
 - hammer handles
- vii. punches
 - starting
 - pin
 - centre
 - aligning
- viii. torque wrenches
 - types
 - sizes
 - purpose
- ix. torque multiplier
- x. torque rods (stick)

3. Describe the procedures to select, use, maintain and store cutting hand tools.

- i. chisels
 - flat
 - cape
 - round nose cape
 - diamond point
 - rivet buster
- ii. chisel holder
- iii. hacksaws
 - types and designs
 - blade classification and selection
- iv. files
 - types, designs and application
 - file handles
 - file cards
- v. twist drills (recognition of sizes – metric and imperial)
 - types and designs
 - sharpening procedures
- vi. taps (recognition of pipe tap sizes – metric and imperial)
 - taper taps
 - plug taps
 - bottoming taps
 - tap handles
- vii. dies (recognition of sizes – metric and imperial)
 - types
 - dies stock
- viii. thread restorers (recognition of sizes – metric and imperial)
 - types and designs

4. Describe the procedures to recondition cutting and non-cutting hand tools.

- i. screwdrivers
- ii. chisels
- iii. screw starters
- iv. punches

5. Identify types of scan tools and digital voltage ohmmeters (DVOM) and describe their applications.

6. Describe the procedures to select, use, maintain and store metric and imperial measuring tools.
 - i. steel rules and squares
 - ii. calipers
 - iii. micrometers
 - iv. dial indicators
 - v. vernier calipers
 - vi. protractors
 - vii. dividers
 - viii. small hole gauges
 - ix. telescoping gauges
 - x. wire gauges
 - xi. drill gauges
 - xii. screw pitch gauges
 - xiii. feeler gauges
7. Describe the procedures to select, use, maintain and store miscellaneous tools.
 - i. stud extractors
 - ii. bushing and seal drivers
 - iii. magnetic pickup tools
 - iv. mechanical pickup tools
 - v. inspection mirrors
 - vi. stamping sets
 - vii. stethoscopes
 - viii. air blowgun

Practical Requirements:

1. Demonstrate the procedures to select, use, inspect, maintain and store hand tools
2. Demonstrate the procedures to select, use, inspect, maintain and store precision measuring instruments.

SV1177 Shop Tools and Equipment

Learning Outcomes:

- Demonstrate knowledge of shop tools and equipment, their applications, maintenance and procedures for use
- Demonstrate knowledge of vehicle hoisting and lifting equipment, their applications and procedures for use.
- Demonstrate knowledge of shop lifting equipment, their applications and procedures for use

Duration: 24 Hours

Pre-Requisite(s): SV1165

Objectives and Content:

1. Identify safety considerations pertaining to vehicle hoisting and lifting.
2. Describe the procedures to select, inspect, store, use and maintain shop equipment.
 - i. hoists, floor, cable, and chain
 - ii. floor jacks
 - iii. safety stands
 - iv. hydraulic presses
 - v. drill presses
 - vi. bench grinders
 - vii. bench vises
 - viii. pullers
 - ix. pneumatic equipment
 - x. mobile cranes
 - xi. high pressure washers (heated)
 - xii. parts cleaners
 - xiii. portable air tanks
 - xiv. caustic cleaning tanks
 - xv. sand/glass bead blasters
 - xvi. air compressors
 - xvii. brake cleaning equipment
 - xviii. spring compressors
 - xix. transmission jacks
 - xx. creepers
3. Describe the procedures to select, inspect, store, use and maintain shop tools.

- i. air tools (pneumatic)
- ii. electric tools
- iii. torque multipliers

4. Describe procedures to select, inspect, store, use and maintain vehicle protective equipment.
 - i. seat covers
 - ii. fender covers
 - iii. floor mats
5. Identify types of hoisting and lifting equipment and accessories and describe their applications.
6. Interpret information pertaining to hoisting and lifting found on drawings and specifications.
7. Describe the procedures used when hoisting and lifting.
8. Describe the procedures used to inspect, maintain hoisting and lifting equipment.

Practical Requirements:

1. Use hoist safely.
2. Raise vehicles by means of a floor jack and place on safety stands.
3. Demonstrate various pieces of shop equipment, their application and procedures for use.
4. Prepare a shop equipment maintenance plan.

SV1188 Fasteners, Tubing and Fittings

Learning Outcomes:

- Demonstrate knowledge of the procedures used to select and use common fasteners, different types of tubing, hoses, fittings, and flaring tools.

Duration: 14 Hours

Pre-Requisite(s): SV1177

Objectives and Content:

1. Describe the procedures to select and use fasteners.
 - i. types of fasteners
 - bolts
 - nuts
 - studs
 - washers
 - flat
 - lock
 - external spring
 - internal spring
 - screws
 - cap screws
 - machine screws
 - sheet metal screws
 - self-tapping screws
 - keys and pins
 - woodruff keys
 - square keys
 - cotter pins
 - spring pins
 - tapered pins
 - clevis pins
 - locking devices (functions and types)
 - compounds
 - liquid compounds
 - lock-type compounds
 - anti-seizure compounds
 - ii. thread classification (metric and imperial)
 - iii. grade markings

- iv. theory of torquing
 - torque pattern
 - torque charts
- 2. Describe the procedures to select and use different types of tubing and hoses.
 - i. types of tubing
 - steel
 - copper
 - non-metallic
 - rubber
 - ii. recognition of sizes
- 3. Describe the procedures to select and use different types of fittings.
 - i. types of low pressure fittings
 - ii. types of flares (metric and imperial)
 - iii. types of threads
 - iv. torque limitation of fittings
 - v. thread sealers
- 4. Identify various types of flaring tools.
 - i. flaring tool kit
 - ii. ISO flaring
 - iii. tubing cutter
 - iv. deburring tool
 - v. tubing bender
 - vi. tubing wrenches
- 5. Describe the procedures to use flaring tools.
 - i. cutting
 - ii. bending
 - iii. flaring

Practical Requirements:

1. Install compression fittings.
2. Cut, flare, bend and connect tubing.
 - i. bubble flare(ISO)
 - ii. double flare(SAE)
 - iii. cut and bend tubing

SV1158 Service Information Systems and Trade Related Documents

Learning Outcomes:

- Demonstrate knowledge of the procedures used to select and use various types of service information systems.
- Demonstrate knowledge of trade related documents and their use.
- Demonstrate knowledge of the procedures used to prepare, interpret, and complete documentation.

Duration: 16 Hours

Pre-Requisite(s): SV1177

Objectives and Content:

1. Identify and interpret types of trade related documents and describe their applications.
 - i. estimates
 - ii. industry standard labour guides
 - iii. manufacturers' specifications
 - iv. standards
 - v. company policies
 - vi. pre-delivery inspections (PDI)
 - vii. preventative maintenance
 - viii. schedules
2. Locate and interpret service information related to identification codes found on the vehicle and vehicle components.
3. Describe the procedures used to prepare and complete documentation.
 - i. work orders
 - ii. estimates
 - iii. pre-delivery inspection reports
 - iv. preventative maintenance reports
4. Explain how to use an operator's manual and how to interpret its sections.

5. Explain how to decode motor vehicle serial numbers for identification purposes through use of appropriate service manual.
 - i. make
 - ii. model
 - iii. year
6. Explain how to use paper and electronic copies of various manuals.
 - i. maintenance and lubrication manual
 - ii. service manual
 - iii. parts manual
 - iv. operator/owner
 - v. special bulletins
 - purpose
 - TSB
7. Explain how to use computerized information systems.
 - i. introduction to computers
 - computerized parts information
 - computerized service and repair information
 - ii. work orders
 - iii. warranty claims
 - iv. time tickets
 - v. vehicle service tracking
 - vi. electronic service

Practical Requirements:

1. Using manuals and several different vehicles, identify the model and year for each vehicle.
2. Complete a work order, document findings and recommendations.
3. Use manuals, to locate removal and installation procedures.
4. Use diagnostic charts to troubleshoot a problem.
5. Use electronic data retrieval systems to locate service information.

SV1217 Tires, Wheels and Hubs

Learning Outcomes:

- Demonstrate knowledge of tires, wheels and hubs, their components and operation.
- Demonstrate knowledge of the procedures used to diagnose and repair tires, wheels and hubs.

Duration: 24 Hours

Pre-Requisite(s): SV1177, SV1642

Objectives and Content:

1. Define terminology associated with tires, wheels and hubs.
2. Identify hazards and safety considerations and describe safe work practices pertaining to tires and wheels.
 - i. tire inflation
 - under inflation
 - over inflation
 - misalignment
 - improper balance
 - ii. tire sizing
3. Interpret tire codes and sidewall markings.
4. Identify tools and equipment relating to tires, wheels and hubs and describe their applications and procedures for use.
5. Identify types of tires and describe their construction.
6. Describe the importance of tire rotation, balance, pressure and maintenance.
7. Identify types of wheels and describe their components and operation.
8. Identify types of hubs and bearing assemblies and describe their components and operation.
9. Identify types of tire pressure monitoring systems and describe their applications.
10. Identify types of lubricants and describe their applications and procedures for use.

11. Describe the relationship between the suspension system and wheel assemblies.
 - i. worn suspension
 - ii. ply steer / radial drag
 - iii. improper load distribution
12. Describe the procedures used to diagnose tires, wheels and hubs and wheel bearings.
 - i. verify concern
 - ii. performs sensory inspection
 - iii. retrieve diagnostic codes
 - iv. access service information
 - v. conduct tests and measurements
 - vi. isolate problem and identify root cause
 - vii. verify the repair
13. Describe the procedures used to repair and/or replace tires and wheel hub assemblies.
14. Describe the procedures used to adjust, repair and/or replace hubs and bearings.

Practical Requirements:

1. Perform radial and lateral run-out check.
2. Perform a tire puncture repair using recommended procedures.
3. Dismount and mount a tire on a wheel with and without a TPMS sensor.
4. Balance a wheel and tire assembly.
5. Service a tapered wheel bearing.

SV1552 Body Components, Accessories and Trim

Learning Outcomes:

- Demonstrate knowledge of body components, accessories and trim and their applications.
- Demonstrate knowledge of the procedures used to diagnose and repair body components, accessories and trim.

Duration: 20 Hours

Pre-Requisite(s): SV1177

Objectives and Content:

1. Identify hazards, safety considerations and describe safe work practices pertaining to body components, accessories and trim.
 - i. interior
 - restraint systems
 - ii. exterior
2. Identify body components, accessories and trim and describe their purpose and operation.
 - i. interior
 - doors
 - seats
 - dashes
 - ii. exterior
 - bumpers
 - mirrors
 - add-on accessories
 - mounts
3. Identify flaws related to interior and exterior components, accessories and trim.
4. Describe the procedures used to diagnose interior and exterior components, accessories and trim.

5. Identify types of electrical/electronic systems and describe their components and operation.
 - i. locks
 - ii. latches
 - iii. windows
 - iv. remote entry
6. Identify types and sources of wind and water leaks and their causes.
 - i. missing sealant and adhesive
 - ii. loose fasteners
 - iii. panel misalignment
 - iv. incorrect clearances
 - v. exterior accessories
7. Identify types of seals, adhesives, cleaners and sealing materials and fasteners and describe their applications and procedures for use.
8. Explain the principles of basic aerodynamics related to body design.
9. Identify types and sources of noise, vibration and harshness (NVH).
 - i. chuckles / loose lumber
 - ii. rattles
 - iii. knocks and whines
 - iv. offensive noises
10. Identify materials used to dampen or interrupt vibration.
 - i. tapes
 - ii. adhesives
 - iii. insulators
11. Identify diagnostic tools and equipment for interior and exterior components, accessories and trim and describe their applications and procedures for use.
12. Describe the procedures used to diagnose body components, accessories and trim.
 - i. verify complaint
 - ii. visually inspect
 - iii. special considerations for paint on sensors and tint on windows.
 - iv. retrieve diagnostic codes
 - v. access service information
 - vi. conduct tests and measurements
 - vii. isolate problem and root cause
 - viii. special considerations for paint on sensors and tint on windows.

13. Describe the procedures used to adjust, repair and/or replace body components, accessories and trim.
 - i. perform repair
 - ii. verify repair

Practical Requirements.

None.

SV1256 Suspension I

Learning Outcomes:

- Demonstrate knowledge of suspension systems and their components and operation.
- Demonstrate knowledge of the procedures used to remove, replace and/or adjust suspension components.
- Demonstrate knowledge of the procedures used to diagnose and repair computer-controlled active suspension systems.

Duration: 48 Hours

Pre-Requisite(s): SV1177

Objectives and Content:

1. Identify safety considerations pertaining to conventional suspension systems.
 - i. loaded components
 - ball joints
 - springs
2. Identify and describe suspension systems and components and their operation.
 - i. design of suspension
 - ii. associated terminology
 - sprung
 - unsprung
 - spring rate
 - iii. types of suspension systems (front and rear)
 - independent
 - solid axle
 - twin beam
 - McPherson strut
 - flex axle
 - air
 - iv. frames
 - types
 - purpose
 - v. bumpers
 - energy absorbing bumpers
 - energy absorbing bumper shocks
 - vi. front and rear suspension components and systems
 - vii. operation of SLA, strut and wish-bone suspensions

3. Describe the procedures to inspect suspension systems.
4. Identify types of dampers and describe their components and operation.
5. Describe procedures to remove and replace dampers.
 - i. checking for serviceability
 - ii. removing and replacing
6. Identify types of stabilizer bars and their operation.
7. Describe procedures to inspect, remove and replace stabilizer bars.
8. Identify types of ball joints and tie rod ends and their operation.
9. Describe procedures to inspect, remove, replace and service ball joints and tie rod ends.
10. Identify types of struts and their operation.
11. Describe procedures to inspect, remove, replace and service struts.
12. Identify types of coil springs and control arms and their operation.
13. Describe procedures to inspect, remove, replace and service coil springs and control arms.
14. Identify types of leaf springs and their operation.
15. Describe procedures to inspect, remove, replace and service leaf springs.
16. Identify types of torsion bars and their operation.
17. Describe procedures to inspect, remove, replace and adjust torsion bars.
18. Identify types of air ride systems and their operation.
 - i. active suspension
 - ii. computer-controlled active suspension system
19. Identify air ride system components.
 - i. height sensor
 - ii. control module
 - iii. air control solenoids
20. Describe procedures to inspect, remove, replace and adjust air ride systems.

21. Describe the procedures used to diagnose conventional suspension systems.
 - i. verify concern
 - ii. performs sensory inspection
 - iii. retrieve diagnostic codes
 - iv. access service information
 - v. conduct tests and measurements
 - vi. isolate problem and identify root cause
 - vii. verify the repair

Practical Requirements:

1. Remove and replace shock absorbers (dampers).
2. Remove and replace stabilizer bars.
3. Remove and replace ball joint.
4. Remove and replace struts.
5. Remove and replace coil springs and control arms.
6. Remove and replace leaf spring.
7. Remove, replace and adjust torsion bars.

SV1228 Steering Systems

Learning Outcomes:

- Demonstrate knowledge of steering systems, their components and operation.
- Demonstrate knowledge of the procedures used to diagnose and repair steering systems.

Duration: 64 Hours

Pre-Requisite(s): SV1177

Objectives and Content:

1. Define terminology associated with steering systems.
2. Identify hazards and describe safe work practices pertaining to steering systems.
 - i. passive restraints
 - air bags
 - clock springs
 - procedures used to disarm
 - ii. collapsible columns
3. Identify tools and equipment relating to steering systems and describe their applications and procedures for use.
4. Identify types of steering columns and describe their components and operation.
 - i. tilt
 - ii. telescopic
 - iii. collapsible
5. Identify types of steering systems and describe their components and operation.
 - i. linkage
 - ii. rack-and-pinion
 - iii. four-wheel steering
6. Introduce steering geometry.
7. Identify types of steering gears and describe their components and operation.
 - i. recirculating ball
 - ii. rack-and-pinion

8. Identify types of assist systems and describe their components and operation.
 - i. electric
 - ii. hydraulic
 - iii. variable
9. Identify types of power steering pumps and describe their components and operation.
10. Identify types of fluids and lubricants, fasteners, tubing, hoses, gaskets and seals and describe their applications.
11. Describe the procedures used to disarm passive restraints.
12. Describe the procedures used to diagnose conventional steering systems.
 - i. verify concern
 - ii. performs sensory inspection
 - iii. retrieve diagnostic codes
 - iv. access service information
 - v. conduct tests and measurements
 - vi. isolate problem and identify root cause
 - vii. verify the repair
13. Describe the procedures used to adjust, repair and/or replace steering system components.

Practical Requirements:

1. Remove and install a steering gear assembly.
2. Diagnose power steering systems.
3. Remove, disassemble and reassemble a steering column.

SV1642 Braking Systems I (Non-ABS)

Learning Outcomes:

- Demonstrate knowledge of braking systems, their components and operation.
- Demonstrate knowledge of the procedures used to diagnose and repair braking systems.

Duration: 60 Hours

Pre-Requisite(s): SV1177

Objectives and Content:

1. Define terminology associated with braking systems.
2. Identify hazards and describe safe work practices pertaining to braking systems.
 - i. hydraulic pressure
3. Explain the fundamentals of braking systems.
4. Explain hydraulic principles related to braking systems.
5. Explain hydraulic systems safety switches and valves.
6. Identify tools and equipment relating to braking systems and describe their applications and procedures for use.
7. Identify types of braking systems and describe their components and operation.
 - i. disc
 - ii. drum
 - iii. parking
8. Identify types of power assists and describe their components and operation.
 - i. vacuum
 - ii. hydraulic
 - iii. electric
9. Identify types of brake fluids and describe their applications and procedures for use.
10. Identify types of fittings, flaring, tubing and hoses and describe their applications and procedures for use.

11. Identify types of trailer brakes and controls and describe their components and operation.
12. Describe the procedures used to diagnose braking systems.
 - i. verify concern
 - ii. performs sensory inspection
 - iii. retrieve diagnostic codes
 - iv. access service information
 - v. conduct tests and measurements
 - vi. isolate problem and identify root cause
 - vii. verify the repair
13. Describe the procedures used to flush and bleed hydraulic brakes.
14. Describe the procedures used to measure and machine components.
15. Describe the procedures used to adjust, repair and/or replace braking system components.

Practical Requirements:

1. Inspect, test and repair drum brakes.
2. Inspect, test and repair disc brakes.
3. Inspect, test and repair hydraulic brake components.
4. Inspect, remove and diagnose power brake system components.
5. Machine drums and disc rotors.

SV1132 Introduction to Electrical and Electronic Principles

Learning Outcomes:

- Demonstrate knowledge of basic electrical and electronic principles.
- Demonstrate knowledge of electrical circuits, their components and operation.
- Demonstrate knowledge of the procedures used to diagnose electrical circuits and components.

Duration: 90 Hours

Pre-Requisite(s): SV1177

Objectives and Content:

1. Identify and explain basic electrical principles.
 - i. safety practices and procedures when working with electrical equipment
 - ii. terminology – abbreviations and glossary of electrical terms
 - iii. sources of electricity
 - generation of electricity
 - use of chemical, magnetic, heat, light, mechanical and DC power supply, crystals, AC circuits
 - iv. theories and laws
 - electricity
 - magnetism and inductance
 - Ohm's law (volts, ohms and amperes, power)
 - v. symbols and schematics
 - common automotive symbols
 - how to read schematics/wiring diagrams
2. Explain electrical principles using Ohm's law to calculate volts, ohms and amperes, and power.
 - i. application of Ohm's law to electrical circuits
 - series circuit
 - parallel circuit
 - series and parallel circuit
3. Interpret electrical schematics.

4. Identify and explain the types of diagnostic tools and equipment used to test components of series, parallel and series-parallel circuits.
 - i. circuit testing devices
 - scan tools
 - multi-meters
 - volt
 - ohm
 - current
 - duty cycle
 - frequency
 - pulse width
 - meter ranges
 - correct hook-up of meters
 - test lights
 - analog
 - digital
 - short finder
5. Describe the procedures used to diagnose electrical circuits and components.
 - i. verify concern
 - ii. performs inspection
 - iii. retrieve diagnostic codes
 - iv. access service information
 - v. conduct tests and measurements
 - vi. isolate problem and identify root cause
 - opens
 - shorts to voltage
 - shorts to ground
 - high resistance
 - vii. verify the repair
6. Identify types of electronic/electrical components and describe their characteristics, composition and applications.
 - i. wires and terminals
 - types and sizes
 - terminals and connectors
 - conductors, semi-conductors, and insulators
 - ii. fibre optics (basics)
 - iii. capacitors
 - construction
 - purpose
 - uses
 - iv. resistors
 - identification

- purpose
- uses
- v. transistors
 - identification
 - purpose
 - uses
- vi. diodes
 - identification
 - purpose
 - uses
- vii. piezoelectric crystal
- viii. hall effect switches
- ix. permanent magnet sensors/switches
- x. circuit protectors
 - fuses
 - fuse links
 - circuit breakers
- xi. relays

7. Explain basic computer operation.

8. Describe the procedures used to replace electrical components.

- i. crimping
- ii. soldering
- iii. terminal replacement
- iv. splicing

Practical Requirements:

1. Read schematics and wiring diagrams.
2. Use circuit testing devices.
 - i. ampmeter
 - ii. ohmmeter
 - iii. voltmeter
 - iv. test lights
3. Apply Ohms Law to electrical circuit.
4. Demonstrate wire and terminal repair.
 - i. demonstrate back probing
 - ii. solder and solderless repair.
5. Test electronic circuits.

SV1377 Batteries

Learning Outcomes:

- Demonstrate knowledge of battery construction and operation.
- Demonstrate knowledge of the procedures used to diagnose battery problems.
- Demonstrate knowledge of the procedures used to service batteries.

Duration: 18 Hours

Pre-Requisite(s): SV1177

Objectives and Content:

1. Identify safety considerations pertaining to batteries.
2. Identify types of batteries, and describe their components and operation.
3. Describe relationship of batteries to the vehicle electrical system.
4. Identify warning indicators.
5. Explain the principles of batteries.
 - i. storage of batteries
 - ii. battery construction
 - positive plates
 - negative plates
 - separators
 - electrolytes
 - chemical action
 - terminals
 - iii. chemical action when discharging
 - iv. chemical action when charging
 - v. sulfated batteries
 - vi. maintenance-free batteries
 - vii. temperature effects on batteries
 - viii. battery polarity
 - ix. battery ratings
 - cold cranking amps
 - reserve capacity rating
 - x. battery selection
 - xi. terminal pullers
 - xii. hold-down clamp

- xiii. battery maintenance
 - procedures to clean batteries
 - battery inspection
 - electrolyte level

6. Describe the procedures to remove and install batteries and battery cables.
7. Identify battery connections.
 - i. parallel circuits
 - ii. series circuits
 - iii. series-parallel circuits
8. Identify and explain the function of equipment used to perform battery tests.
 - i. hydrometer
 - ii. refractometer
 - iii. built-in hydrometer
9. Describe procedures to test batteries.
 - i. testing electrolyte levels
 - ii. testing batteries
 - specific gravity variation (correcting specific gravity readings to allow for temperature)
 - parasitic draw
 - light-load test
 - high-discharge test
 - cold-cranking test
 - reserve capacity test
10. Identify and describe methods used to recharge batteries and explain the precautions to take when recharging a battery.
 - i. methods
 - slow charge method
 - fast charge method
 - trickle charging
 - ii. precautions
 - battery temperature precautions
 - importance of good ventilation
 - safety precautions with highly explosive gases

11. Identify types of cable terminals and explain how to select the proper cable size.
 - i. types of cable terminals
 - ii. cable size selection
12. Describe procedures to replace battery cables and/or terminals.
 - i. fastening terminals to cable (soldered and crimped)
 - ii. installing corrosion inhibitor over terminals (importance)
13. Identify precautions to consider when starting engines with a booster battery.
 - i. importance of proper booster cables
 - ii. proper polarity and connections
 - iii. series connections
 - iv. protective glasses
 - v. safety precautions
14. Describe procedures to start engines with a booster battery.
15. Identify causes of battery problems.
 - i. effects on battery life
 - electrolyte level
 - overcharging
 - undercharging
 - cycling
 - ii. battery hold-down loose or too tight
 - iii. corroded terminals
 - iv. frayed or broken cables
 - v. cracked case
 - vi. damaged battery trays and covers
 - vii. causes of battery discharge
16. Describe the procedure to diagnose battery problems (voltage drop test).

Practical Requirements:

1. Perform a parasitic draw test.
2. Remove and replace a battery.
3. Perform a voltage drop test.

4. Test batteries.
 - i. load test
 - ii. specific gravity
5. Charge battery.
 - i. slow
 - ii. fast

SV1287 Drive Shafts and Axle Shafts

Learning Outcomes:

- Demonstrate knowledge of drive shafts and axles, their components and operation.
- Demonstrate knowledge of the procedures used to diagnose and repair drive shafts and axles.

Duration: 30 Hours

Pre-Requisite(s): SV1177

Objectives and Content:

1. Identify types of drive shafts and axles and describe their composition.
2. Identify safety considerations pertaining to drive shafts and axles.
3. Identify tools and equipment used with drive shafts and axles and describe their applications and procedures for use.
4. Identify rear wheel drive components and explain their function.
 - i. types of drive lines
 - hotchkiss
 - torque tube
 - insulated
 - two-piece
 - ii. types of universal joints
 - cross and roller
 - constant velocity
5. Describe and explain operation of front-wheel drive axle shafts.
 - i. axle retainers, fasteners and shafts
 - ii. support bearing
 - iii. steering knuckles
 - iv. axle disconnects
 - v. locking hubs
 - vi. constant velocity joints
 - vii. bearings
 - viii. lubricants
 - ix. gaskets, seals and sealants

6. Describe procedures to inspect, diagnose, remove, service and install axle shaft systems and components.
 - i. constant velocity(CV) joint
 - ii. drive axle joint boots and clamps
 - iii. steering knuckles
 - iv. wheel bearings and seals
 - v. support bearings
7. Describe procedures to inspect, diagnose, remove, service and install drive shaft systems on rear drive vehicles.
 - i. removing
 - ii. rear-end torqueing
 - iii. balancing (causes of unbalance and effects)
 - iv. phasing
 - v. installing
 - vi. angles
 - vii. indexing
8. Describe the procedures used to diagnose drive shafts and axle shaft systems.
 - i. verify concern
 - ii. performs sensory inspection
 - iii. retrieve diagnostic codes
 - iv. access service information
 - v. conduct tests and measurements
 - vi. isolate problem and identify root cause
 - vii. verify the repair
9. Describe procedures to service universal joints on rear drive vehicles.
 - i. inspecting
 - ii. lubricating
10. Describe procedures to check drive line angles on rear drive vehicles and explain the purpose of doing so.
11. Describe procedures to adjust drive line angles on rear drive vehicles.
 - i. transmission
 - ii. rear axle
 - iii. drive shaft

Practical Requirements:

1. Perform service on drive shafts/axle shafts and related components rear wheel front wheel.
2. Remove, dismantle, inspect, lubricate and reassemble universal joints.
3. Check and adjust drive line angles on rear drive vehicles.
4. Balance drive shaft and check installation phase and angles of rear wheel drive shaft.

SV1306 Engine Principles (Gasoline and Diesel)

Learning Outcomes:

- Demonstrate knowledge of engine theory.
- Demonstrate knowledge of engines, their components and operation.

Duration: 90 Hours

Pre-Requisites: SV1177

Objectives and Content:

1. Define terminology associated with engines.
 - i. gasoline
 - ii. diesel
2. Explain internal combustion principles.
 - i. gasoline
 - ii. diesel
3. Identify types of engine classifications, and describe their construction.
 - i. fuel
 - diesel
 - gasoline
 - alternate fuels
 - ii. stroke
 - iii. cooling systems
 - air
 - liquid
4. Identify types of engine configurations and describe their construction.
5. Identify types of valve train configurations and describe their construction.
 - i. push rod
 - ii. overhead cam
 - iii. multi-valve
 - iv. variable valve lift, variable valve timing

6. Identify engine components and describe their design, purpose and operation.
 - i. block assembly
 - ii. cylinder head assembly
 - iii. timing
 - gears
 - belts
 - chains
 - variable
 - iv. mounts
7. Identify related components and describe their relationship to engine assembly.
 - i. engine oil coolers
 - ii. lines
 - iii. hoses
 - iv. pulleys
8. Identify types of fasteners, gaskets, seals and sealants and describe their applications and procedures for use.
9. Describe and calculate engine displacement, compression ratios, horsepower, torque area and volume.
10. Identify oil classifications.
 - i. diesel
 - ii. gasoline

Practical Requirements:

1. Disassemble an engine, identify various components and reassemble.

SV1600 Ignition Systems

Learning Outcomes:

- Demonstrate knowledge of the procedures used to test and service ignition systems.
- Demonstrate knowledge of the procedures used to diagnose repair ignition system problems.

Duration: 30 Hours

Pre-Requisite(s): SV1377

Objectives and Content:

1. Identify hazards and describe safe work practices pertaining to ignition systems.
 - i. high voltage
2. Identify and describe electronic ignition systems and components and their operation.
 - i. principles of operation of ignition systems
 - distributor type
 - distributor-less type
 - ii. components
 - triggering devices
 - optical
 - hall effect switches
 - magnetic generators
 - ignition points
 - reluctor
 - control unit
 - distributor assembly
 - rotor
 - coil

3. Describe procedures to check and test the condition of components of electronic ignition systems.
 - i. pick-up coil
 - ii. control unit
 - iii. ignition coil
 - iv. distributor cap
 - v. rotor
 - vi. wires
4. Identify and describe spark plugs.
 - i. construction of spark plugs
 - ii. types
 - iii. heat range
5. Describe procedures to remove, service and install spark plugs.
 - i. removing
 - ii. inspecting
 - iii. gapping
 - iv. testing
 - v. installing/torqueing
6. Describe procedures to diagnose the following ignition system problems on conventional and distributor less systems.
 - i. no spark at plugs
 - ii. weak or intermittent spark at plugs
 - iii. missing at idle or low speed
 - iv. missing during acceleration
 - v. missing at all speeds
 - vi. coil failure
 - vii. short spark plug life
 - viii. pre-ignition problems
 - ix. detonation problems
 - x. backfiring in intake manifold
 - xi. backfiring in exhaust manifold
 - xii. incorrect timing

Practical Requirements:

1. Check and adjust ignition timing.
2. Perform a coil output test.
3. Check and adjust spark plug gap.
4. Perform a secondary wire resistance test.
5. Use specialized diagnostic equipment.

SV1387 Introduction to Starting Systems

Learning Outcomes:

- Demonstrate knowledge of the purpose and operation of all major parts of the starting system.
- Demonstrate knowledge of the procedures to diagnose and repair starting systems.

Duration: 30 Hours

Pre-Requisite(s): SV1377

Objectives and Content:

1. Identify types of starter systems.
 - i. direct drive
 - ii. gear reduction
 - iii. permanent magnet
2. Identify the components of a starting system and their operation.
 - i. starter switches
 - ii. starter relays
 - iii. starter solenoids
3. Identify types of starting control systems and describe their components and operation.
 - i. anti-theft
 - ii. safety
 - iii. keyless start/stop
4. Describe procedures to diagnose starting problems.
 - i. following safety procedures
 - ii. using test meters
 - meters/equipment
 - iii. performing starting system diagnosis
 - battery
 - cables and grounds
 - ring gear and flywheel
 - starter damage
 - neutral and clutch safety switches
 - theft deterrents
 - iv. testing starter

- current test
- circuit voltage drop
- load test / no load test
- torque test
- v. testing starter (internal)
 - armature
 - commutator
 - field windings
 - solenoids
 - relays
 - brushes
 - bushings

5. Describe the procedures to test, and repair or replace starting systems and components.

- i. testing system
- ii. servicing starter
- iii. replacing bushing
- iv. replacing brush

Practical Requirements:

1. Diagnose starting problems.
2. Repair/replace starting systems on vehicle.
3. Remove and replace starter.
4. Perform a starter test (internal).

SV1396 Introduction to Charging Systems

Learning Outcomes:

- Demonstrate knowledge of the procedures used to test and service charging systems and components.
- Demonstrate knowledge of the procedures used to diagnose charging system problems.

Duration: 30 Hours

Pre-Requisite(s): SV1377

Objectives and Content:

1. Identify hazards and describe safe work practices pertaining to charging systems.
2. Identify and describe AC generators and components and explain their principles of operation.
 - i. basic charging systems
 - ii. operating principles of AC generators
 - iii. identification of parts
 - stator
 - rotor
 - diodes
 - rectifier bridge
 - brushes
 - iv. types and functions of regulators
 - transistorized regulator
 - remote mounted regulator
 - integral type regulator
 - computer controlled regulator
 - v. types of AC generators
 - brushless AC generator
 - 12 volt AC generator
 - 12/24 volt AC generator

3. Describe procedures to disassemble, test, repair and reassemble AC generators.
 - i. disassembling AC generators
 - internal circuitry
 - ii. testing AC generator components
 - stator
 - rotor
 - diodes
 - regulator
 - iii. testing AC generator performance
 - AC generator output test
 - voltage
 - amperage
 - appropriate testing equipment
 - iv. checking bearing condition
 - v. checking slip ring condition
 - vi. cleaning
 - vii. reassembling
4. Describe procedures to diagnose the following charging system problems.
 - i. no AC generator output
 - ii. low AC generator output
 - iii. high AC generator output
 - iv. noisy AC generator
 - v. battery uses excessive electrolyte

Practical Requirements:

1. Perform charging system tests using equipment recommended by manufacturer.
2. Make adjustments and repairs to charging system components.
3. Diagnose charging system components.
4. Remove and replace generator.
5. Generator and regulator test (internal).

SV1311 Introduction to Cooling Systems

Learning Outcomes:

- Demonstrate knowledge of the purpose and operation of all major parts of cooling systems.

Duration: 30 Hours

Pre-Requisite(s): SV1177

Objectives and Content:

1. Identify and describe cooling systems.
 - i. function
 - ii. types
 - air cooled
 - liquid cooled
 - iii. recovery system
 - pressurized
 - non-pressurized
2. Identify and describe components of an engine cooling system and their purpose/function.
 - i. radiator
 - types
 - cross flow
 - down flow
 - construction
 - metal
 - plastic
 - aluminum
 - ii. radiator cap
 - iii. radiator and heater hoses
 - types
 - hose clamp
 - thermostat
 - iv. water pump
 - drives
 - v. fan assembly
 - types of drive
 - clutch

- electric
- hydraulic
- shroud
- controls
- vi. coolant
 - types
 - gasoline
 - diesel
 - mixing
 - additives
- vii. block heater
 - types
 - in block
 - in line
 - metal heating element
- viii. warning systems and indicators
 - lights
 - gauges
 - audible

3. Describe procedures to inspect, test and replace the following engine cooling system components.

- i. radiator
- ii. heater core assembly
- iii. radiator cap
- iv. radiator hoses
- v. heater hoses
- vi. water pump
- vii. mechanical/electric driven fan
- viii. coolant

4. Describe procedures to diagnose the following problems with cooling systems.

- i. overheating
- ii. overcooling
- iii. leaks

5. Describe procedures to bleed air from cooling systems.

6. Identify types of antifreeze.

7. Describe procedures to mix, install and recycle antifreeze.
 - i. mixing
 - ii. testing
 - iii. adding additives
8. Describe procedures to drain, clean and refill cooling systems.

Practical Requirements:

1. Diagnose problems with a cooling system.
2. Drain and flush a coolant system.
3. Mix, install and recycle antifreeze.

SV1197 Lubrication and Fluids Servicing

Learning Outcomes:

- Demonstrate knowledge of the procedures used to change engine oil and filter, and lubricate a vehicle's chassis.

Duration: 24 Hours

Pre-Requisite(s): SV1177

Objectives and Content:

1. Identify different types of oil and describe procedures to select and use them based on the following criteria.
 - i. oil classification
 - API
 - SAE
 - synthetic
 - ii. oil viscosity
 - iii. oil additives
 - iv. function of the oil
 - v. contamination (recognition of contaminated fluid)
 - vi. oil selection
 - hydraulic oil (transmission and steering)
 - function
 - classification
 - gear oil
 - function
 - classification
2. Describe procedures to change engine oil.
 - i. draining the oil
 - ii. handling hot oil
 - iii. cleaning and inspecting drain plug and gasket for serviceability
 - iv. filling
 - v. checking oil level
 - vi. properly torqueing drain plug
 - vii. storing used oil
 - viii. following precautions after performing an oil change
 - ix. install/record service date and reminder
 - x. service intervals

- xi. super/turbocharger precautions

3. Describe procedures to change engine oil filters.

- i. selecting filter
 - construction of filter
 - types of filters
- ii. removing oil filter
- iii. installing/replacing oil filter seals
- iv. ensuring cleanliness
- v. analyzing filter failure
 - physical filter failure
 - filter case expanded
 - filter leaking at seams

4. Describe procedures to start and run engines.

- i. inspecting for oil leaks
- ii. checking engine oil pressure
- iii. checking oil level
- iv. check warning indicators
- v. audible
- vi. gauges
- vii. lights
- viii. operating and resetting engine monitoring system according to manufacturer's specifications

5. Identify different types of grease and the criteria for selecting and using them.

- i. types of grease
 - wheel bearing grease
 - chassis grease
 - high temperature grease
 - multipurpose grease
 - extreme pressure grease
- ii. properties
- iii. function
- iv. classification

6. Identify equipment used to lubricate a vehicle's chassis.

- i. grease gun (hand and pneumatic)
- ii. grease fitting
- iii. grease gun adapters

7. Describe procedures to lubricate vehicle's chassis.
 - i. refilling the grease gun
 - ii. storing and handling grease
 - iii. interpreting lubricating charts
8. Identify issues surrounding the disposal of used lubricants.
 - i. environmental issues
 - ii. health issues
 - iii. filter crushers
 - iv. proper disposal procedures
9. Describe the procedures used to perform oil analysis.
 - i. collecting specimen
 - ii. determining contamination of sample
 - iii. identifying contaminants in sample
 - iv. interpreting analysis
10. Identify types of warning systems and indicators and describe their purpose and operation.

Practical Requirements:

1. Lubricate a chassis following the manufacturer's recommendations.
2. Change engine oil and filter(s).

SV1691 Introduction to Accessory Drive Systems

Learning Outcomes:

- Demonstrate knowledge of accessory drive systems, their components and operation.
- Demonstrate knowledge of the procedures used to diagnose and repair accessory drive systems.

Duration: 18 Hours

Pre-Requisite(s): SV1177

Objectives and Content:

1. Define terminology associated with accessory drive systems.
2. Identify hazards and describe safe work practices pertaining to accessory drive systems.
3. Identify tools and equipment relating to accessory drive systems and describe their applications and procedures for use.
4. Identify types of accessory drive systems and describe their components and operation.
 - i. belt tension/tensioners
 - ii. belts
 - iii. drives
 - electric
 - hydraulic
 - gear
5. Describe the procedures used to diagnose accessory drive systems.
6. Describe the procedures used to adjust, repair and/or replace accessory drive system components.

Practical Requirements:

None.

SV1681 Preventative Vehicle Maintenance Inspections (PMI)

Learning Outcomes:

- Demonstrate knowledge of the procedures to perform a preventative vehicle maintenance inspection.
- Demonstrate knowledge of the procedures to replace minor components.
- Demonstrate knowledge of vehicle maintenance inspections and their purpose.

Duration: 24 Hours

Pre-Requisite(s): SV1177, SV1197

Objectives and Content:

1. Explain the background and rationale for designing a preventative maintenance schedule.
 - i. background on preventative maintenance inspections
 - ii. importance of performing a PM inspection
 - prevent expensive breakdowns
 - prevent small problems from becoming large ones
 - establish regular service patterns and help scheduling
 - provide better feedback on operating costs
 - iii. example of PM inspection form
 - iv. levels of PM inspection (e.g., minor inspection vs. major inspection)
2. Describe the procedures to design a preventative maintenance schedule.
 - i. methods used to arrive at PM schedules and forms
3. Describe the procedures to perform a vehicle preventative maintenance inspection.
 - i. procedures to be followed when performing a PM inspection
 - inspection only
 - inspection plus scheduled replacement of some items
 - same as above plus repairs up to a certain dollar figure
 - ii. inspection during maintenance
 - air filters
 - battery electrolyte level
 - battery connections
 - brakes
 - cooling liquid level
 - cooling liquid concentration
 - automatic transmission fluid level

- manual transmission fluid level
- transfer case fluid level
- rear axle fluid level
- front axle fluid level (4x4)
- oil leaks
- windshield washer fluid level
- power steering fluid level
- brake fluid level
- belts (condition)
- constant velocity boots (visual inspection)
- exhaust system (visual inspection)
- shock absorbers and struts (visual inspection)
- tires (visual inspection)
- gas tanks (visual inspection)
- transmission filters
- brake fluid flush
- timing belt
- spark plugs
- fuel injection cleaning
- lighting
- wiper blades
- steering linkage

4. Identify tools and equipment used to perform vehicle maintenance inspections.

Practical Requirements:

1. Locate PM inspection lists, vehicle owner's manuals and vehicle manufacturer's manuals.
2. Perform a PMI.
3. Repair or replace minor components such as:
 - i. wiper blades
 - ii. light bulbs
 - iii. accessory belts

SV1700 Hybrid Systems I

Learning Outcomes:

- Demonstrate knowledge of hybrid systems, their components and operation.

Duration: 24 Hours

Pre-Requisite(s): SV1177, SV1377

Objectives and Content:

1. Define terminology associated with hybrid systems.
2. Identify hazards and describe safe work practices pertaining to hybrid systems.
 - i. PPE
 - ii. high voltage
 - iii. extreme cold temperatures
 - iv. braking systems
3. Identify tools and equipment relating to hybrid vehicles and describe their applications and procedures for use.
4. Identify types of hybrid vehicles and their related components.
 - i. series
 - ii. parallel
 - iii. series-parallel
 - iv. plug-in
5. Describe high voltage vehicle disconnect procedures.

Practical Requirements:

None.

SV1125 Gaskets, Seals and Bearings

Learning Outcomes:

- Demonstrate knowledge of the procedures used to select, remove and install various types of bearings, gaskets, seals, and sealing compounds.
- Demonstrate knowledge of the procedures used identify causes of friction bearing failures.

Duration: 30 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Identify and describe friction bearings.
 - i. definition
 - ii. location
2. Identify causes of friction bearing failure.
 - i. contamination
 - ii. insufficient lubrication
 - iii. improper installation
 - iv. misalignment
 - v. overloading
 - vi. corrosion
3. Identify and describe anti-friction bearings.
 - i. definition
 - ii. location
 - iii. types
 - ball
 - roller
 - needle
 - iv. loading design
 - radial
 - thrust
 - combination
 - v. identification methods

4. Identify causes of anti-friction bearing failure.
 - i. spalling
 - ii. brinelling
 - iii. over-heating
 - iv. cracked race
 - v. broken or dented cage
 - vi. dented shields
 - vii. corrosion
 - viii. dirt wear
 - ix. electrical pitting
 - x. improper installation
5. Describe procedures to remove and install anti-friction bearings.
 - i. removing and installing
 - ii. cleaning
 - iii. inspecting
 - iv. lubricating
 - v. adjusting
 - vi. storing and handling
 - vii. following safety precautions
6. Identify and describe oil seals.
 - i. function
 - ii. classification
 - static
 - dynamic
 - iii. types
 - iv. materials
 - v. construction
7. Identify causes of oil seal failure.
8. Describe procedures to remove and install oil seals.
 - i. removing and installing
 - ii. inspecting
 - iii. cleaning (knowing the importance of cleanliness)
 - iv. using proper tools (knowing the importance of using proper tools)
 - v. storing and handling
9. Identify and describe gaskets.
 - i. function
 - ii. types
 - iii. materials
 - iv. making a gasket (methods)

10. Identify causes of gasket failure.
11. Describe procedures to remove and install gaskets.
 - i. removing and installing
 - ii. cleaning (knowing the importance of cleanliness)
 - iii. torquing bolts
12. Identify and describe sealing compounds.
 - i. types
 - ii. purpose
13. Identify causes of sealing compound failure.
14. Describe procedures to select and use sealing compounds and the precautions to follow when using them.

Practical Requirements:

1. Remove, service and install a tapered bearing.
2. Fabricate and install a gasket.
3. Remove and replace a non-serviceable bearing.
4. Remove and install an oil seal.
5. Apply sealer as a gasket.

WD1301 Oxy-Fuel Welding/Cutting

Learning Outcomes:

- Demonstrate knowledge of the procedures used to operate oxy-fuel heating and cutting equipment to industrial safety standards for the removal and/or installation of parts.
- Demonstrate knowledge of the procedures used to perform braze welding and flame cutting using oxy-fuel equipment.

Duration: 30 Hours

Pre-Requisite(s): SV1177

Objectives and Content:

1. Define and explain terminology associated with oxy-acetylene heating and cutting equipment.
2. Describe procedures to operate oxy-fuel heating and cutting equipment to industrial safety standards for the removal and/or installation of parts.
 - i. following safety precautions
 - safety apparel
 - storage and handling of welding gases
 - pre-operational inspection
 - ii. setting up equipment
 - cylinders
 - gauges
 - regulators
 - valves-flame arrestor
 - torches and tips
 - hoses
 - testing for leaks
 - iii. operating the torch
 - lighting procedures
 - types of flames and effect on materials
 - shutting down procedures
3. Identify oxy-acetylene heating and cutting equipment and accessories, and describe their applications.
4. Describe the procedures used to inspect, store and maintain oxy-acetylene equipment.

5. Describe procedures to perform braze welding using oxy-acetylene equipment.
6. Describe procedures to perform flame cutting with oxy-acetylene equipment.
 - i. selecting cutting torch and tips
 - ii. using cutting torch

Practical Requirements:

1. Assemble, test, light and adjust oxy-fuel welding and cutting equipment.
2. Perform flame cutting with oxy-fuel equipment.
3. Perform proper shut down procedures.

SV1710 Gas Metal Arc Welding (GMAW [MIG])

Learning Outcomes:

- Demonstrate knowledge of gas metal arc welding equipment, their applications, maintenance and procedure for use.
- Demonstrate knowledge of weld defects, their causes and the procedures to prevent and correct them.

Duration: 30 Hours

Pre-Requisite(s): SV1177

Objectives and Content:

1. Define and explain terminology associated with gas metal arc welding GMAW (MIG).
2. Identify hazards and describe safe work practices pertaining to GMAW (MIG).
 - i. personal
 - ii. shop/facility
 - iii. equipment
3. Identify GMAW (MIG) equipment and accessories and describe their applications.
 - i. equipment
 - ii. shielding gases
 - iii. filler wire
4. Identify types of GMAW (MIG) processes and describe their characteristics and applications.
5. Describe the procedures used to set-up, adjust and shut-down GMAW (MIG) equipment to industrial standards as needed for various motorized equipment.
6. Describe the procedures used to weld GMAW (MIG) equipment.
7. Describe the procedures used to inspect, maintain and store GMAW (MIG) equipment.
8. Identify and describe types of weld defects, their causes and the procedures used to prevent and correct them.

Practical Requirements:

1. Weld using MIG equipment.
2. Perform set up and shut down procedures.

SV2282 Pre-Delivery Inspection

Learning Outcomes:

- Demonstrate knowledge of the procedures used to perform pre-delivery inspections.

Duration: 18 Hours

Pre-Requisites: SV1681

Objectives and Content:

1. Explain the purpose of a pre-delivery inspection.
2. Identify pre-delivery inspection procedures and requirements.
3. Describe the procedures used to perform pre-delivery inspections.

Practical Objectives:

1. Perform vehicle operational checks.

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 Indicator**⁴ and **Essential Skills self-assessment for the trades**⁵ are to be used unless the instructor provides a similar assessment tool or tools.
2. Participate in a group discussion about the impact of gaps in essential skills that may be revealed by the self-assessments completed, and the value of improving essential skills.

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

Resources:

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

AM1101 Math Essentials

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

Learning Outcomes:

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

Duration: 42 Hours

Pre-Requisite(s): None

Objectives and Content:

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

1. Describe whole number operations.
 - i. read, write, count, round off, add, subtract, multiply and divide whole numbers
2. Describe the application of the order of operations in math problems.
3. Describe fraction and mixed number operations.
 - i. read, write, add, subtract, multiply and divide fractions
4. Describe decimal operations.
 - i. read, write, round off, add, subtract, multiply and divide decimals

5. Describe percent/decimal/fraction conversion and comparison.
 - i. convert between fractions, decimals and percents
6. Identify percentage operations.
 - i. read and write percentages
 - ii. calculate base, rates and percentages
7. Identify ratio and proportion operations.
 - i. use a ratio comparing two quantities with the same units
 - ii. use a proportion comparing two ratios
8. Describe the use of the imperial measurement system in math problems.
 - i. identify units of measurement
 - length
 - mass
 - area
 - volume
 - capacity
9. Describe the use of the metric measurement system in math problems.
 - i. identify units of measurement
 - length
 - mass
 - area
 - volume
 - capacity
10. Identify angles, lines and geometric shapes.
 - i. use a protractor to measure angles
 - ii. determine whether an angle is right, acute or obtuse
 - iii. identify parallel, perpendicular, horizontal and vertical lines
 - iv. identify types of triangles, quadrilaterals, and 3-dimensional shapes
11. Describe estimation strategies.
 - i. estimate a linear measure using a referent
 - ii. estimate length, area and volume of objects in metric and imperial systems
12. Describe problem solving that involves linear measurement using instruments such as rulers or tape measures, in the metric and imperial systems.

Practical Requirements:

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

AM1221 Automotive Service Math Fundamentals

Learning Outcomes:

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

Duration: 42 Hours

Pre-Requisite(s): AM1101

Objectives and Content:

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

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

- i. angle calculations
- ii. circle calculations

7. Identify math processes used to complete administrative trade tasks.

- i. material estimation
- ii. material costing
- iii. time & labour estimates
- iv. taxes & surcharges
- v. markup & projecting revenue

Practical Requirements:

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

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

Duration: 24 Hours

Pre-Requisite(s): None

Objectives and Content:

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

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

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

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

Practical Requirements:

None.

MC1062 Computer Essentials

Learning Outcomes:

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

Duration: 15 Hours

Pre-Requisite(s): None

Objectives and Content:

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

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

- i. create folders
- ii. copy files and folders
- iii. move files and folders
- iv. rename files and folders
- v. delete files and folders

5. Describe the use of word processing software to create documents.

- i. enter & edit text
- ii. indent and tab text
- iii. change text attributes
 - bold
 - underline
 - font
- iv. change layout format
 - margins
 - alignment
 - line spacing
- v. spell check and proofread
- vi. save, close & reopen a document
- vii. print document

6. Describe the use of spreadsheet software to create documents.

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

7. Describe the use of the internet in the workplace.

- i. web browsers
- ii. search engines
- iii. security issues
- iv. personal responsibility for internet use at work

8. Describe the role of e-mail.

- i. e-mail etiquette
 - grammar and punctuation
 - privacy issues when sharing and forwarding e-mail
 - work appropriate content
 - awareness of employer policies
- ii. managing e-mail
 - using folders
 - deleting, forwarding, replying
- iii. adding attachments to e-mail
- iv. view e-mail attachments

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

Practical Requirements:

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

AP1102 Introduction to Apprenticeship

Learning Outcomes:

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

Duration: 12 Hours

Pre-Requisite(s): None

Objectives and Content:

1. Define terminology associated with apprenticeship.
 - i. apprentice
 - ii. registered apprentice
 - iii. trade qualifier
 - iv. journeyperson
 - v. certified journeyperson
 - vi. Certificate of Apprenticeship
 - vii. Certificate of Qualification
 - viii. dual certification
 - ix. compulsory trades
2. Explain the roles and responsibilities of those involved in the apprenticeship system in Newfoundland and Labrador.
 - i. registered apprentice
 - ii. training institution
 - iii. employer
 - iv. journeyperson
 - v. mentor
 - vi. Department of 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 exam
 - 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 2 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

Automotive Service Technician-7200 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	70%	<ul style="list-style-type: none"> ▪ Completion of Level 2 training ▪ Pass AACS Level 2 exam* ▪ Minimum 3600 hours of combined relevant work experience and training 	3 rd Year
3 rd	80%	<ul style="list-style-type: none"> ▪ Completion of Level 3 training ▪ Pass AACS Level 3 exam* ▪ Minimum 5400 hours of combined relevant work experience and training 	4 th Year
4 th	90%	<ul style="list-style-type: none"> ▪ Completion of Level 4 training ▪ Pass AACS Level 4 exam* ▪ Minimum 7200 hours of combined relevant work experience and training ▪ Sign-off of all workplace skills in apprentice logbook ▪ Pass certification exam 	Journeyperson Certification
Wage Rates <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. 			
*Level Exams This program may not currently contain level exams, in which case this requirement will be waived until such time as level exams are available.			

Automotive Service Technician-7200 Hours		
Class Calls (After Apprenticeship Registration)		
Call Level	Requirements for Class Call	Hours awarded for In-School Training
Level 2	▪ Minimum of 3000 hours of relevant work experience and training	240
Level 3	▪ Minimum of 5000 hours of relevant work experience and training	210
Level 4	▪ Minimum of 7000 hours of relevant work experience and training	240

Class calls at Minimum Hours:

- 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 7200 hours.

Or

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

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

E. Roles and Responsibilities of Stakeholders in the Apprenticeship Process

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

The Apprentice:

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

