COURSE PTA3400: MATERIAL HANDLING

Level: First Period Apprenticeship

Prerequisite: PTA3900: Apprenticeship Safety

Description: Students develop knowledge, skills and attitudes in the areas of material handling, receiving, stocking and staging techniques.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyperson certification as a parts technician.

ILM Resources: Supply Chain, Material Handling Terminology and Receiving Documentation 270102a; Receiving: Process and Track Incoming Material 270102b; Stocking and Staging 270102c

Outcomes: The student will:

1. be able to receive incoming material

1.1 outline the supply chain, including:
- 1.1.1 material management and supply or distribution chain
- 1.1.2 types of warehouses; e.g., raw material, processing plant, finished goods, distribution and local warehouses
- 1.1.3 types of warehouse operations; e.g., commodity (bulk), general merchandise, manufacturing, health services, grocery, refrigerated storage, bonded, distribution centres and third-party warehouse operations
- 1.1.4 describing end users of the parts supply chain; e.g., industrial accounts, fleet accounts, professional installers and customer end users

1.2 define material handling terminology

1.3 describe the documentation related to receiving, including:
- 1.3.1 bill of lading
- 1.3.2 waybills
- 1.3.3 receiving record
- 1.3.4 packing slip (list)
- 1.3.5 freight claim form
- 1.3.6 receiving receipt
- 1.3.7 return goods authorization (RGA)
- 1.3.8 customs papers; e.g., Canada Customs duties, brokerage papers, GST/HST/PST/QST forms
- 1.3.9 purchase orders
- 1.3.10 transportation of dangerous goods (TDG) manifest
- 1.3.11 material safety data sheets (MSDS)
- 1.3.12 discrepancy reports
- 1.3.13 material transfer orders
- 1.3.14 shipping notices

2. process and track incoming material

2.1 explain the procedure for processing shipments of materials received, including:
- 2.1.1 carrier arrival
- 2.1.2 unloading of materials
- 2.1.3 initial product inspection
- 2.1.4 detailed product inspection
- 2.1.5 product identification
- 2.1.6 damage assessment and reporting
- 2.1.7 documentation processing
- 2.1.8 product storage
- 2.1.9 security

2.2 describe the importance of paying attention to detail for receiving procedure, specifically:
- 2.2.1 scheduled deliveries and demurrage charges
- 2.2.2 inbound information
- 2.2.3 misdirected shipments
- 2.2.4 losses and damages
- 2.2.5 customer backorders and emergency orders
- 2.2.6 *Transportation of Dangerous Goods (TDG) Act* documentation and a material safety data sheet (MSDS) for WHMIS-controlled materials
- 2.2.7 special handling labels

2.3 describe quality assurance standards and requirements

2.4 describe global positioning system (GPS) and radio frequency identification (RFID) technology, including:
- 2.4.1 RFID components
- 2.4.2 trilateration
- 2.4.3 navigation systems, location tracking and traffic scheduling

3. stock and stage incoming material

3.1 describe the importance of proper stock identification and locating of materials, including:
- 3.1.1 the four steps of the material identification process
- 3.1.2 identification numbers, part numbers or stock keeping unit (SKU) numbers
- 3.1.3 regular stock or inventory items
- 3.1.4 non-stocking or special order items
- 3.1.5 supersessions (change-ups, updates or replacements) resulting from change in material, change in design or change in manufacturer
- 3.1.6 cataloguing items, using commodity grouping with classes or sub-groups
- 3.1.7 cross-reference listings
- 3.1.8 marking and labelling
- 3.1.9 automatic identification systems, including barcode types and universal product code (UPC) types

3.2 apply stocking procedures, including:
- 3.2.1 fixed bin locations
- 3.2.2 random location system
- 3.2.3 zoned location system
- 3.2.4 point of use location system
- 3.2.5 staging

4. demonstrate basic competencies

4.1 demonstrate fundamental skills to:

- 4.1.1 communicate
- 4.1.2 manage information
- 4.1.3 use numbers
- 4.1.4 think and solve problems

4.2 demonstrate personal management skills to:

- 4.2.1 demonstrate positive attitudes and behaviours
- 4.2.2 be responsible
- 4.2.3 be adaptable
- 4.2.4 learn continuously
- 4.2.5 work safely

4.3 demonstrate teamwork skills to:

- 4.3.1 work with others
- 4.3.2 participate in projects and tasks

5. create a transitional strategy to accommodate personal changes and build personal values

5.1 identify short-term and long-term goals

5.2 identify steps to achieve goals

COURSE PTA3405: STORAGE & PACKING

Level: First Period Apprenticeship

Prerequisites: PTA3900: Apprenticeship Safety
PTA3400: Material Handling

Description: Students develop knowledge, skills and attitudes in the areas of material storage; picking and issuing freight; and the proper process for packing goods.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyperson certification as a parts technician.

ILM Resources: Material Storage 270102d; Picking and Issuing 270102e; Packing 270102f

Outcomes: The student will:

1. store materials

1.1 describe considerations for the storage of materials, including:
- 1.1.1 product characteristics such as fragile products or those requiring refrigeration
- 1.1.2 security issues such as locked cabinets or controlled access to lock-up area
- 1.1.3 popularity of the item and how often it is shipped
- 1.1.4 other considerations; e.g., keeping similar-sized items or items that are normally shipped together stored in the same place

1.2 identify the benefits of appropriate storage methods, including:
- 1.2.1 block stacking
- 1.2.2 stacking frames
- 1.2.3 drive-in and drive-thru racks
- 1.2.4 gravity flow racks
- 1.2.5 bin shelving
- 1.2.6 modular storage cabinets
- 1.2.7 vertical and horizontal shelving
- 1.2.8 cantilever racking

1.3 describe legislative and legal requirements relating to the storage of particular materials, including:
- 1.3.1 *OHS* Code Part 10-165on flammable or combustible materials
- 1.3.2 *OHS* Code Part 19-279 on smoking and ignition source proximity
- 1.3.3 *OHS* Code Part 12 Section 187 regarding the use of pallets and storage racks
- 1.3.4 hazardous materials
- 1.3.5 compressed gas cylinders
- 1.3.6 liquefied propane gas (LPG)
- 1.3.7 refrigerants
- 1.3.8 brake fluid
- 1.3.9 battery acid
- 1.3.10 asbestos

1.4 describe common storage systems used on the work site, including:
- 1.4.1 fixed and fixed sequential
- 1.4.2 category or related grouping
- 1.4.3 random
- 1.4.4 speed of movement (popularity of an item)
- 1.4.5 point of use
- 1.4.6 special order goods storage

2. fill and issue orders

2.1 explain the order cycle, including authorization and documentation

2.2 describe picking procedures, including:
- 2.2.1 basic order picking
- 2.2.2 batch picking
- 2.2.3 zone picking
- 2.2.4 wave picking
- 2.2.5 pallet picking
- 2.2.6 case picking
- 2.2.7 piece or split-case picking

2.3 describe issuing procedures

2.4 identify reasons for product allocation

3. pack materials

3.1 describe packing materials, including:
- 3.1.1 plastic or paper bags
- 3.1.2 anti-static bags
- 3.1.3 polywoven bags
- 3.1.4 cardboard cartons/boxes
- 3.1.5 corrugated cardboard
- 3.1.6 fibreboard boxes
- 3.1.7 plastic containers
- 3.1.8 skeleton and full crates
- 3.1.9 sleeves
- 3.1.10 padded envelopes
- 3.1.11 specialty containers
- 3.1.12 air bubble sheets, bubble packs and bubble wraps
- 3.1.13 air bags
- 3.1.14 egg crate convoluted packing foam
- 3.1.15 foam in place
- 3.1.16 formed polystyrene
- 3.1.17 kraft paper
- 3.1.18 volatile corrosion inhibiting (VCI) paper
- 3.1.19 peanut filler and polystyrene chips/sheets/wrapping
- 3.1.20 polyethylene foams
- 3.1.21 tapes, strappings and stretch wraps

3.2 describe packing methods for primary containers, secondary containers and unitizing loads, including:
- 3.2.1 distribution packaging
- 3.2.2 shipping packaging
- 3.2.3 pallets, skids and nesting plastic pallets
- 3.2.4 shrink wrap and steel or plastic banding
- 3.2.5 labelling

4. demonstrate basic competencies

4.1 demonstrate fundamental skills to:
- 4.1.1 communicate
- 4.1.2 manage information
- 4.1.3 use numbers
- 4.1.4 think and solve problems

4.2 demonstrate personal management skills to:
- 4.2.1 demonstrate positive attitudes and behaviours
- 4.2.2 be responsible
- 4.2.3 be adaptable
- 4.2.4 learn continuously
- 4.2.5 work safely

4.3 demonstrate teamwork skills to:
- 4.3.1 work with others
- 4.3.2 participate in projects and tasks

5. create a transitional strategy to accommodate personal changes and build personal values

5.1 identify short-term and long-term goals

5.2 identify steps to achieve goals

COURSE PTA3410: SHIPPING & RETURNS

Level: First Period Apprenticeship

Prerequisites: PTA3900: Apprenticeship Safety
PTA3400: Material Handling

Description: Students develop knowledge, skills and attitudes in the areas of shipping products, dealing with product returns and ensuring adequate stock maintenance.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyperson certification as a parts technician.

ILM Resources: Shipping 270102g; Product Returns 270102h; Stock Maintenance 270102i

Outcomes: The student will:

1. ship materials

1.1 identify types of shipments, taking into consideration:
- 1.1.1 product characteristics; e.g., hazardous nature of good, weight, size, quantity
- 1.1.2 time considerations
- 1.1.3 freight rates
- 1.1.4 free on board or freight on board (FOB) costs
- 1.1.5 destination

1.2 determine mode of shipping and their advantages and disadvantages, including:
- 1.2.1 air transport
- 1.2.2 marine
- 1.2.3 pipeline
- 1.2.4 rail
- 1.2.5 road
- 1.2.6 intermodal
- 1.2.7 courier and express service
- 1.2.8 parcel post
- 1.2.9 bus
- 1.2.10 hotshot delivery

1.3 identify documentation related to shipping, including:
- 1.3.1 shipping manifest
- 1.3.2 bill of lading
- 1.3.3 terms of payment such as prepaid (PPD) or cash on delivery (COD)
- 1.3.4 carrier liability
- 1.3.5 shipping record (i.e., logbook)
- 1.3.6 *Transportation of Dangerous Goods Act*, requirements and documentation

2. process product returns

2.1 identify internal and external product return procedures and related documentation, including:
- 2.1.1 exchange items (cores)
- 2.1.2 warranty returns
- 2.1.3 wrong items issued
- 2.1.4 items not required
- 2.1.5 wrong parts ordered
- 2.1.6 unclaimed COD shipments
- 2.1.7 return time limit
- 2.1.8 item inspection and damaged products
- 2.1.9 restocking charges
- 2.1.10 non-returnable products
- 2.1.11 recalls
- 2.1.12 inventory management implications

2.2 outline policies and procedures for maintaining a core/exchange program, including:
- 2.2.1 refurbished components
- 2.2.2 rebuilt components
- 2.2.3 remanufactured components
- 2.2.4 core charges
- 2.2.5 core storage

3. maintain stock

3.1 explain stock maintenance procedures, including:
- 3.1.1 relocating stock
- 3.1.2 tracking stocking quantity changes
- 3.1.3 repacking damaged material or packaging
- 3.1.4 rotating stock
- 3.1.5 recording overages and shortages
- 3.1.6 completing audits such as physical inventory count or cycle counts
- 3.1.7 removing obsolete stock
- 3.1.8 organizing seasonal stock

4. demonstrate basic competencies

4.1 demonstrate fundamental skills to:
- 4.1.1 communicate
- 4.1.2 manage information
- 4.1.3 use numbers
- 4.1.4 think and solve problems

4.2 demonstrate personal management skills to:
- 4.2.1 demonstrate positive attitudes and behaviours
- 4.2.2 be responsible
- 4.2.3 be adaptable
- 4.2.4 learn continuously
- 4.2.5 work safely

4.3 demonstrate teamwork skills to:
- 4.3.1 work with others
- 4.3.2 participate in projects and tasks

5. create a transitional strategy to accommodate personal changes and build personal values

5.1 identify short-term and long-term goals

5.2 identify steps to achieve goals

COURSE PTA3415: MERCHANDISING

Level: First Period Apprenticeship

Prerequisites: PTA3900: Apprenticeship Safety
PTA3400: Material Handling
PTA3405: Storage & Packing
PTA3410: Shipping & Returns

Description: Students develop knowledge, skills and attitudes in the areas of merchandising, material handling equipment and the use of catalogues.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyperson certification as a parts technician.

ILM Resources: Merchandising 270102j; Material Handling Equipment 270102k; Catalogues 270102l

Outcomes: The student will:

1. implement merchandising strategies

1.1 define merchandising and merchandising programs, including:
- 1.1.1 demand items: traffic-building items, competitive items and captive items
- 1.1.2 impulse items
- 1.1.3 related sales
- 1.1.4 staff training around merchandise, attitude and appearance
- 1.1.5 seasonal sales
- 1.1.6 new product promotions
- 1.1.7 end-of-production sales

1.2 describe merchandising related to daily operations, including:
- 1.2.1 one-shot promotions such as truckload sales or loss leaders
- 1.2.2 inventory reduction sales
- 1.2.3 condition and location of display areas
- 1.2.4 physiology of colour
- 1.2.5 value of timely and current merchandising themes
- 1.2.6 housekeeping
- 1.2.7 facing the shelf or bin
- 1.2.8 security issues
- 1.2.9 safety concerns

1.3 describe locations and methods for building displays, including:
- 1.3.1 showroom (new and used)
- 1.3.2 customer reception
- 1.3.3 service reception
- 1.3.4 display design factors such as balance, harmony, emphasis, proportion and rhythm
- 1.3.5 floor space layout
- 1.3.6 types of display fixtures

2. describe material handling equipment and safety markings

2.1 identify material handling equipment, including:
- 2.1.1 non-powered wheeled material handling equipment
- 2.1.2 powered material handling equipment
- 2.1.3 gripping tools
- 2.1.4 dispensing tools
- 2.1.5 measuring tools

2.2 identify packaging equipment, including:
- 2.2.1 cutting tools
- 2.2.2 sealing tools such as glue guns and stapling tools
- 2.2.3 binding tools such as stretch wrap and shrink wrap tools or machines
- 2.2.4 banding tools
- 2.2.5 labelling and marking tools

2.3 identify hazards related to material handling equipment, including:
- 2.3.1 slippery surfaces
- 2.3.2 obstructions
- 2.3.3 inadequate lighting
- 2.3.4 ramps and deck plates
- 2.3.5 low clearances
- 2.3.6 pedestrians
- 2.3.7 ventilation
- 2.3.8 fires and explosions

2.4 describe safety markings applied to material handling equipment, including:
- 2.4.1 data plates
- 2.4.2 safety markings and labels; e.g., fasten seat belt
- 2.4.3 inspection checklists

3. explain the purpose of material catalogues

3.1 describe the function of catalogues

3.2 describe the structure of catalogues, including:
- 3.2.1 front cover
- 3.2.2 general information
- 3.2.3 user guide
- 3.2.4 table of contents
- 3.2.5 index
- 3.2.6 trade abbreviations
- 3.2.7 data and illustration sections
- 3.2.8 footnotes
- 3.2.9 rear sections
- 3.2.10 revisions

3.3 identify types of catalogues, including:
- 3.3.1 original equipment manufacturer (OEM) master catalogue
- 3.3.2 jobber (aftermarket) master catalogue
- 3.3.3 supplementary catalogue
- 3.3.4 quick reference catalogue
- 3.3.5 accessory catalogue
- 3.3.6 price catalogue
- 3.3.7 cross-reference catalogue
- 3.3.8 special equipment catalogue

3.4 describe the purpose of vehicle identification numbers and serial numbers

4. demonstrate basic competencies

4.1 demonstrate fundamental skills to:

- 4.1.1 communicate
- 4.1.2 manage information
- 4.1.3 use numbers
- 4.1.4 think and solve problems

4.2 demonstrate personal management skills to:

- 4.2.1 demonstrate positive attitudes and behaviours
- 4.2.2 be responsible
- 4.2.3 be adaptable
- 4.2.4 learn continuously
- 4.2.5 work safely

4.3 demonstrate teamwork skills to:

- 4.3.1 work with others
- 4.3.2 participate in projects and tasks

5. create a transitional strategy to accommodate personal changes and build personal values

5.1 identify short-term and long-term goals

5.2 identify steps to achieve goals

COURSE PTA3420: MEASUREMENT & STOCK

Level: First Period Apprenticeship

Prerequisite: PTA3900: Apprenticeship Safety

Description: Students develop knowledge, skills and attitudes in doing measurement calculations and using measuring tools; identifying standard stock items; and identifying consumables.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyperson certification as a parts technician.

ILM Resources: Measuring Calculations 270103a; Measuring Tools 270103b; Standard Stock 270103o; Consumables 270103p

Outcomes: The student will:

1. perform calculations related to common measurements

- 1.1 perform calculations related to measurement using imperial and metric units, including:
  - 1.1.1 length
  - 1.1.2 distance
  - 1.1.3 area
  - 1.1.4 volume
  - 1.1.5 weight
  - 1.1.6 density
  - 1.1.7 temperature
- 1.2 explain the term torque
- 1.3 convert numbers between decimals and fractions
- 1.4 calculate percentages

2. use measuring tools

- 2.1 perform linear measurements in imperial and SI units, using:
  - 2.1.1 steel rules
  - 2.1.2 measuring tapes
  - 2.1.3 Vernier, slide, dial and electronic digital calipers
  - 2.1.4 micrometers
  - 2.1.5 dial indicators
  - 2.1.6 inside and outside calipers
  - 2.1.7 Plastigauge
  - 2.1.8 feeler gauges
  - 2.1.9 spark plug gauges
  - 2.1.10 small hole gauges
  - 2.1.11 telescoping gauges
- 2.2 demonstrate use of measuring tools, including:
  - 2.2.1 checking for wear
  - 2.2.2 checking for zero setting
  - 2.2.3 adjusting and recalibrating

3. identify standard stock items common to the trade

3.1 identify fastening devices, including alloys and grades, such as:

- 3.1.1 threaded fasteners; e.g., bolts, cap screws, nuts, studs, threaded inserts
- 3.1.2 fastener sizing requirements; e.g., thread pitch, thread diameter, threads per inch or millimetres, length in inches or millimetres
- 3.1.3 types of alloys; e.g., steel, aluminum, brass, copper, nickel, stainless steel, bronze
- 3.1.4 grade or class and tensile strength of fasteners
- 3.1.5 tread design (form) and series; e.g., Unified National Fine (UNF) or Unified National Course (UNC), Unified National Pipe Thread (UNPT)
- 3.1.6 type of bolt head design; e.g., square head, hexagon, carriage bolt, plow bolt, socket head, 12-point cap screws
- 3.1.7 thread repair inserts (i.e., Heli-Coil), thread lubrication, thread sealers and thread lockers
- 3.1.8 various nut and washer configurations, uses and types
- 3.1.9 self-threading screws

3.2 identify lines and fittings, including:

- 3.2.1 pipe fittings
- 3.2.2 nipples
- 3.2.3 unions
- 3.2.4 bushings
- 3.2.5 specialized application materials; e.g, stainless steel, monels, copper alloys, aluminum, brass
- 3.2.6 aluminum, copper, plastic, steel or stainless steel tubing
- 3.2.7 compression fittings
- 3.2.8 flare fittings

3.3 identify specialty items, including:

- 3.3.1 internal and external snap rings and clips
- 3.3.2 linkage clips
- 3.3.3 lock rings (retaining rings)
- 3.3.4 set screws
- 3.3.5 square, flat and shaft/hub assembly (woodruff) keys
- 3.3.6 pins; e.g., cotter pins, internal hair pins, clevis pins, radial locking pins, locking pins, dowel pins
- 3.3.7 rivets
- 3.3.8 trim fasteners, clips and speed nuts
- 3.3.9 shims and shim stock
- 3.3.10 hose clamps
- 3.3.11 locking wires
- 3.3.12 frost and expansion plugs

4. identify consumables

4.1 identify compounds and mixtures, including:

- 4.1.1 adhesives (e.g., epoxies, super glue adhesive and duct tape) and sealants (e.g., silicone products, gasket sealers and threadlockers)
- 4.1.2 lubricants; e.g., general purpose grease, bearing grease, dry or powder graphite, cutting fluids, anti-seize lubricants, engine assembly lubricants, penetrating fluids
- 4.1.3 starting fluid or ether and solvents (e.g., acetone, isopropyl alcohol, methyl hydrate and turpentine)
- 4.1.4 floor dry granular products
- 4.1.5 windshield washer fluids
- 4.1.6 shop towels, rags and wipes
- 4.1.7 brake and parts cleaners

4.2 identify shop supplies, including:
- 4.2.1 abrasives
- 4.2.2 adhesives
- 4.2.3 cleaners
- 4.2.4 documentation
- 4.2.5 electrical supplies
- 4.2.6 fasteners
- 4.2.7 fluids
- 4.2.8 lubricants
- 4.2.9 PPE
- 4.2.10 tire shop supplies
- 4.2.11 welding supplies
- 4.2.12 miscellaneous

4.3 identify hazards related to repackaging and storing consumables, including:
- 4.3.1 storing, transporting and mounting for use compressed-gas cylinders
- 4.3.2 storing and using volatile chemicals
- 4.3.3 protecting metal tools and paper products

5. demonstrate basic competencies

5.1 demonstrate fundamental skills to:
- 5.1.1 communicate
- 5.1.2 manage information
- 5.1.3 use numbers
- 5.1.4 think and solve problems

5.2 demonstrate personal management skills to:
- 5.2.1 demonstrate positive attitudes and behaviours
- 5.2.2 be responsible
- 5.2.3 be adaptable
- 5.2.4 learn continuously
- 5.2.5 work safely

5.3 demonstrate teamwork skills to:
- 5.3.1 work with others
- 5.3.2 participate in projects and tasks

6. create a transitional strategy to accommodate personal changes and build personal values

6.1 identify short-term and long-term goals

6.2 identify steps to achieve goals

COURSE PTA3425: ELECTRICAL BASICS

Level: First Period Apprenticeship

Prerequisite: PTA3900: Apprenticeship Safety

Description: Students develop knowledge, skills and attitudes around electrical fundamentals, electrical circuits and battery fundamentals.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyperson certification as a parts technician.

ILM Resources: Electrical Fundamentals 270103e; Electrical Circuits 270103f; Battery Fundamentals 270103g

Outcomes: The student will:

1. explain the fundamentals of electricity

- 1.1 recognize common electrical symbols used in the trade
- 1.2 explain the physical qualities of insulators, conductors and semiconductors, including:
  - 1.2.1 conductor insulation
  - 1.2.2 conductor sizing
  - 1.2.3 dielectric grease usage
  - 1.2.4 insulator failure
  - 1.2.5 conductor failure
- 1.3 explain magnetism and electromagnetism and their properties, including:
  - 1.3.1 magnetic fields and flux lines
  - 1.3.2 attraction and repel characteristics
  - 1.3.3 permeability
  - 1.3.4 reluctance
  - 1.3.5 magnetic strength
- 1.4 explain the measurement of electromotive force, current, resistance and power, including:
  - 1.4.1 voltage (electromotive force) and its sources such as electrochemical, electromagnetic induction, thermoelectric, electrostatic, photoelectric and piezoelectric
  - 1.4.2 resistance and factors determining resistance such as cross-sectional area, length, temperature and types of materials, intensity of current flow and the type of current
- 1.5 describe the purpose of current control devices, including:
  - 1.5.1 manual, mechanical, magnetic (relay) and pressure switches
  - 1.5.2 transistors
  - 1.5.3 fuses
  - 1.5.4 circuit breakers
  - 1.5.5 fusible links

2. explain the fundamentals of electrical circuits

2.1 identify the three basic circuits and their basic properties:
- 2.1.1 series circuits
- 2.1.2 parallel circuits
- 2.1.3 series-parallel circuits

2.2 explain open, short and grounded circuits

2.3 describe how to use a digital multimeter

2.4 explain the operation of diodes, special-purpose diodes and transistors

3. describe the operation of the battery and handling procedures

3.1 describe common batteries and their advantages and disadvantages, including:
- 3.1.1 primary cells
- 3.1.2 secondary cells
- 3.1.3 dry cells
- 3.1.4 wet cells
- 3.1.5 lead-acid batteries
- 3.1.6 low-maintenance and maintenance-free batteries
- 3.1.7 deep cycle batteries
- 3.1.8 hybrid batteries
- 3.1.9 gel cells
- 3.1.10 wound cells

3.2 identify hazards encountered with lead-acid batteries

3.3 explain battery construction, sizing and capacity, including:
- 3.3.1 positive and negative plates
- 3.3.2 plate separators
- 3.3.3 elements
- 3.3.4 electrolyte
- 3.3.5 cell connectors
- 3.3.6 reserve capacity rating
- 3.3.7 ampere hour rating
- 3.3.8 cold cranking rating cranking amps

3.4 list precautions and procedures for boosting batteries

3.5 list precautions and procedures for charging batteries, including:
- 3.5.1 slow charging
- 3.5.2 fast charging
- 3.5.3 tickle charging
- 3.5.4 open-circuit voltage test
- 3.5.5 specific gravity measurement
- 3.5.6 high rate discharge test (load test)

3.6 describe handling, storage and disposal of batteries and electrolyte

4. demonstrate basic competencies

4.1 demonstrate fundamental skills to:
- 4.1.1 communicate
- 4.1.2 manage information
- 4.1.3 use numbers
- 4.1.4 think and solve problems

4.2 demonstrate personal management skills to:
    4.2.1 demonstrate positive attitudes and behaviours
    4.2.2 be responsible
    4.2.3 be adaptable
    4.2.4 learn continuously
    4.2.5 work safely
4.3 demonstrate teamwork skills to:
    4.3.1 work with others
    4.3.2 participate in projects and tasks

5. create a transitional strategy to accommodate personal changes and build personal values

5.1 identify short-term and long-term goals
5.2 identify steps to achieve goals

COURSE PTA3430: SUSPENSION & WHEELS

Level: First Period Apprenticeship

Prerequisite: PTA3900: Apprenticeship Safety

Description: Students learn about the operation and components of bearings, seals and suspension systems and about wheels, tires and hubs.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual who holds certification as a parts technician journeyperson.

ILM Resources: Bearings 270103c; Seals 270103d; Light-Duty Suspension Systems 270103h; Wheels, Tires and Hubs 270103j

Outcomes: The student will:

1. describe common bearings
- 1.1. state the functions of bearings, showing an understanding of:
  - 1.1.1 bearing loads
  - 2.1.1 classes of bearings
- 1.2. describe friction bearings, including:
  - 1.2.1 split bearings (thin-shell type)
  - 1.2.2 wrapped, solid, floating, prelubricated and dry bushings
  - 1.2.3 hydrodynamic bearings
  - 1.2.4 thrust bearings
- 1.3. describe anti-friction bearings, including:
  - 1.3.1 ball bearings
  - 1.3.2 needle bearings
  - 1.3.3 roller bearings
- 1.4. describe storage methods and methods of supplying bearings, including:
  - 1.4.1 by application
  - 1.4.2 use of cross-reference materials
  - 1.4.3 measuring the dimensions

2. describe seals and their functions
- 2.1. state the function of seals, including:
  - 2.1.1 static seals
  - 2.1.2 dynamic seals
  - 2.1.3 external and integral seals
- 2.2. identify seals and their applications, including:
  - 2.2.1 gaskets
  - 2.2.2 radial lip seals
  - 2.2.3 wear sleeves
  - 2.2.4 hydrodynamic seals
  - 2.2.5 split seals
  - 2.2.6 mechanical seals
  - 2.2.7 diaphragm seals
  - 2.2.8 various types of sealants, adhesives and threadlockers
  - 2.2.9 packings

2.2.10 O-rings
2.2.11 felt seals

2.3. describe information required to supply replacement seals by:
2.3.1 application
2.3.2 measurement
2.3.3 cross-reference

3. describe the operation of light-duty steering systems and identify replacement parts

3.1 identify steering linkage types and explain their operation, including:
3.1.1 drag link (fore and aft)
3.1.2 Haltenberger
3.1.3 parallelogram (solid centre link)
3.1.4 rack and pinion

3.2 explain the function and lubrication requirements of common light-duty manual steering gears, including:
3.2.1 recirculating ball and nut steering gear
3.2.2 rack and pinion steering gear

3.3 explain the function of power steering gears, including:
3.3.1 integral
3.3.2 non-integral
3.3.3 rack and pinion

3.4 describe the operation of power steering pumps, including:
3.4.1 roller type
3.4.2 vane type
3.4.3 slipper type
3.4.4 gear type

3.5 explain the function and design features of steering column safety features, including:
3.5.1 flexible couplings
3.5.2 breakaway mounting
3.5.3 collapsible shafts

3.6 identify common replacement parts and related sales opportunities, including:
3.6.1 steering dampener
3.6.2 pitman arm
3.6.3 idler arm
3.6.4 steering gearbox bearings/bushings
3.6.5 steering gearbox seal kits
3.6.6 power steering belt
3.6.7 power steering hose
3.6.8 power steering gearbox seal kit
3.6.9 rack and pinion
3.6.10 steering gearbox lubricant

4. describe the design features and purpose of wheels, tires and hubs

4.1 explain the construction, sizing and rating of automotive and light truck tires and wheels, including:
4.1.1 bias-ply, bias-belted and radial-belted tire construction
4.1.2 sizing made up of vehicle application, use, cross section width, aspect ratio, construction and wheel diameter
4.1.3 wear rating, traction rating, temperature resistance rating, speed rating and load rating
4.1.4 directional tires, run flat tires and space saver tires
4.1.5 steel rims, alloy wheels and directional wheels

4.2 explain the construction, sizing and rating of heavy-duty truck tires and wheels, including:
- 4.2.1 tube type and tubeless tires
- 4.2.2 tire tread design and tire retreading (capping)
- 4.2.3 split rims, spoke wheels, disc wheels and dual tires
- 4.2.4 sizing made up of section width in inches or in millimetres and wheel or rim diameter in inches
- 4.2.5 identifying the radial mark

4.3 explain the purpose of static and dynamic balancing

4.4 describe causes of tire wear and common repair methods, including:
- 4.4.1 under and over inflation
- 4.4.2 misalignment
- 4.4.3 imbalance
- 4.4.4 suspension or steering problems
- 4.4.5 tire plug, patch and plug-patch combination repairs

4.5 identify components of a wheel hub and spindle assembly, including:
- 4.5.1 tapered roller bearings
- 4.5.2 sealed ball bearings
- 4.5.3 steering knuckle
- 4.5.4 spindle assembly
- 4.5.5 brake rotors
- 4.5.6 inner and outer wheel bearing assemblies and adjusting nut

4.6 identify common replacement parts and related sales opportunities, including:
- 4.6.1 tires
- 4.6.2 wheels
- 4.6.3 wheel studs
- 4.6.4 wheel nuts
- 4.6.5 rim clamps
- 4.6.6 wheel weights
- 4.6.7 valve stems and extensions
- 4.6.8 wheel bearings
- 4.6.9 wheel seals

5. demonstrate basic competencies

5.1 demonstrate fundamental skills to:
- 5.1.1 communicate
- 5.1.2 manage information
- 5.1.3 use numbers
- 5.1.4 think and solve problems

5.2 demonstrate personal management skills to:
- 5.2.1 demonstrate positive attitudes and behaviours
- 5.2.2 be responsible
- 5.2.3 be adaptable
- 5.2.4 learn continuously
- 5.2.5 work safely

5.3 demonstrate teamwork skills to:
- 5.3.1 work with others
- 5.3.2 participate in projects and tasks

6. create a transitional strategy to accommodate personal changes and build personal values

6.1 identify short-term and long-term goals

6.2 identify steps to achieve goals

COURSE PTA3435: STEERING & BRAKES

Level: First Period Apprenticeship

Prerequisite: PTA3900: Apprenticeship Safety

Description: Students learn about steering systems and hydraulic drum and disc brake systems, electric brakes, and antilock brake systems.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual who holds certification as a parts technician journeyperson.

ILM Resources: Light Duty Steering Systems 270103i; Hydraulic Brake System Fundamentals 270103k; Hydraulic Drum Brake Systems 270103l; Hydraulic Disc Brake Systems 270103m; Hydraulic Brake Systems, Power Assist, Electric Brakes and Antilock Brake Systems 270103n

Outcomes: The student will:

1. describe the operation of light-duty suspension systems

- 1.1 explain the operation of light-duty suspension systems, including:
  - 1.1.1 squat, dive, steering, roll, road and G-forces
  - 1.1.2 sprung and unsprung weight
- 1.2 describe springs used in light-duty suspension systems, including:
  - 1.2.1 fixed and variable rate leaf springs
  - 1.2.2 fixed and variable rate coil springs
  - 1.2.3 longitudinal and transverse mounted torsion bars
  - 1.2.4 air springs
- 1.3 describe the operation of shock absorbers, including:
  - 1.3.1 dual-action hydraulic
  - 1.3.2 gas-charged
  - 1.3.3 spring-assisted
  - 1.3.4 air-assisted
  - 1.3.5 electronic levelling
  - 1.3.6 electronic ride control
- 1.4 describe the operation of suspension components, including:
  - 1.4.1 stabilizer bars
  - 1.4.2 control arms
  - 1.4.3 suspension bushings
  - 1.4.4 ball joints
- 1.5 describe suspension design, including:
  - 1.5.1 solid axle; e.g., I-beam and twin I-beam suspensions
  - 1.5.2 independent front suspension systems
  - 1.5.3 double wishbone suspension, short and long arm (SLA) suspension, MacPherson strut and modified strut
  - 1.5.4 rear-wheel drive, rear axle suspension systems; e.g., leaf spring models, coil spring models, independent rear-wheel drive, trailing arm suspension
  - 1.5.5 solid rear axle suspension
  - 1.5.6 single-pivot rear suspension

1.5.7 multiple control arm rear suspension
1.5.8 air suspension or electronic level control (ELC) systems
1.5.9 electronic dampening systems or automatic ride control systems

1.6 identify common replacement parts and related sales opportunities, including:
1.6.1 shock absorbers
1.6.2 stabilizer bar bushings
1.6.3 link kits
1.6.4 ball joints

2. describe the fundamentals of brake systems and identify types of brake fluids

2.1 explain the principles that apply to brake systems, including:
2.1.1 the law of conservation of energy
2.1.2 kinetic energy
2.1.3 vehicle weight and speed
2.1.4 thermal or heat energy
2.1.5 friction and the coefficient of friction

2.2 state Pascal's law and its implications for brake systems

2.3 choose the correct brake fluid for a given application based on purpose, function and characteristics of brake fluids, including:
2.3.1 viscosity
2.3.2 boiling point
2.3.3 non-corrosive features
2.3.4 hygroscopic features
2.3.5 lubrication
2.3.6 stability
2.3.7 miscibility

2.4 explain the operation of common brake components, including:
2.4.1 pressure differential, metering and proportioning valves
2.4.2 master cylinders
2.4.3 wheel cylinders
2.4.4 brake calipers
2.4.5 lines and hoses

2.5 describe the operation of hydraulic components when used as a system, including:
2.5.1 resting position
2.5.2 applying position (light, medium and heavy application)
2.5.3 releasing

2.6 identify common replacement parts and related sales opportunities, including:
2.6.1 master cylinder
2.6.2 brake lines
2.6.3 wheel cylinders
2.6.4 calipers
2.6.5 brake fluid
2.6.6 brake pads
2.6.7 brake shoes

3. describe the operation of hydraulic drum brake systems

3.1 explain the operation of drum brake system components, including:
- 3.1.1 energized and non-energized shoes
- 3.1.2 dual-servo and leading-trailing shoe arrangements
- 3.1.3 shorter (primary) and longer (secondary) shoe linings
- 3.1.4 backing plate
- 3.1.5 organic, synthetic, semi-metallic and carbon fibre-reinforced carbon (CFRC) brake shoe linings
- 3.1.6 riveted and bonded brake shoe linings
- 3.1.7 wheel cylinders
- 3.1.8 hold-down, return and adjusting springs
- 3.1.9 self-adjusters
- 3.1.10 composite, bimetallic, cast iron and centrifugally cast composite drum construction
- 3.1.11 fixed (hubbed) and floating (hubless) drum designs
- 3.1.12 cooling and balancing features of brake drums
- 3.1.13 inspection to determine condition and to determine machining requirements

3.2 explain the operation of drum-type parking brake systems, including:
- 3.2.1 application and release mechanisms
- 3.2.2 warning lights
- 3.2.3 park cables operation
- 3.2.4 park brake hardware

3.3 identify common replacement parts and related sales opportunities, including:
- 3.3.1 drums
- 3.3.2 brake shoes
- 3.3.3 wheel cylinder kits
- 3.3.4 springs and hardware
- 3.3.5 lines and hoses
- 3.3.6 park brake cables

4. describe the operation of hydraulic disc brake systems

4.1 explain the operation of disc brake systems, including:
- 4.1.1 integral and floating disc designs
- 4.1.2 solid and vented disc construction
- 4.1.3 measurement and surface condition inspection
- 4.1.4 floating (sliding) and fixed calipers and their mounting components
- 4.1.5 brake pad and wear indicator designs
- 4.1.6 silencers and anti-squeal compounds

4.2 explain the operation of disc-type parking brake systems, including:
- 4.2.1 foot pedal and hand lever application and release mechanisms
- 4.2.2 warning lights
- 4.2.3 park brake cables
- 4.2.4 drum-in-hat style parking brake
- 4.2.5 integral (caliper-activated park brake)

4.3 identify common replacement parts and related sales opportunities, including:
- 4.3.1 lines and hoses
- 4.3.2 caliper seals and boots
- 4.3.3 bushings, bolts and pins
- 4.3.4 rotors
- 4.3.5 brake pads
- 4.3.6 springs and retainer clips

5. describe the operation and identify supply replacement parts of assisted brake systems, electric brake systems and antilock brake systems

- 5.1 describe the operation of vacuum-operated power brake units
- 5.2 describe the operation of hydraulically operated power brake units
- 5.3 describe the operation of electro-hydraulic power brake units
- 5.4 explain the operation of air-over-hydraulic power brake units
- 5.5 explain the operation of electric braking systems, including:
  - 5.5.1 intertia-operated electric brake controller
  - 5.5.2 hydraulically operated electric brake controller
  - 5.5.3 breakaway switch and auxiliary breakaway battery
- 5.6 explain the operation of an antilock brake system (ABS), including:
  - 5.6.1 add-on or integral systems
  - 5.6.2 one-channel systems
  - 5.6.3 three-channel systems
  - 5.6.4 four-channel ABS
  - 5.6.5 traction control (TC) operation
- 5.7 identify common replacement parts and related sales opportunities, including:
  - 5.7.1 hydrovac
  - 5.7.2 hydro-boost
  - 5.7.3 integral unit
  - 5.7.4 sensors
  - 5.7.5 accumulators
  - 5.7.6 electronic control unit (ECU)

6. demonstrate basic competencies

- 6.1 demonstrate fundamental skills to:
  - 6.1.1 communicate
  - 6.1.2 manage information
  - 6.1.3 use numbers
  - 6.1.4 think and solve problems
- 6.2 demonstrate personal management skills to:
  - 6.2.1 demonstrate positive attitudes and behaviours
  - 6.2.2 be responsible
  - 6.2.3 be adaptable
  - 6.2.4 learn continuously
  - 6.2.5 work safely
- 6.3 demonstrate teamwork skills to:
  - 6.3.1 work with others
  - 6.3.2 participate in projects and tasks

7. create a transitional strategy to accommodate personal changes and build personal values

- 7.1 identify short-term and long-term goals
- 7.2 identify steps to achieve goals

COURSE PTA3440: COMMUNICATION

Level: First Period Apprenticeship

Prerequisite: PTA3900: Apprenticeship Safety

Description: Students develop knowledge, skills and attitudes in verbal and written communication.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyperson certification as a parts technician.

ILM Resources: Science of Communication 270104a; Verbal Communication 270104b; Written Communication 270104c

Outcomes: The student will:

1. identify effective communication

- 1.1 describe communication (basic psychology and nature), including:
  - 1.1.1 verbal; e.g., taking into account choice of words, pronunciation, rate of speech and tone of voice
  - 1.1.2 non-verbal; e.g., body language such as facial expressions, gestures, posture and body movements
  - 1.1.3 written; e.g., symbols and words that may vary dependent upon the formality
- 1.2 describe communication barriers, including:
  - 1.2.1 psychological; e.g., emotions, culture, biases, conflict and stress and personal motive
  - 1.2.2 experience; e.g., status or positional bias, vocabulary, knowledge and clichés, jargon or slang
  - 1.2.3 situational factors; e.g., distractions or noise, timing, time, distance, medium and receiver
- 1.3 describe what makes communication work, including:
  - 1.3.1 clarity
  - 1.3.2 conciseness
  - 1.3.3 accuracy
  - 1.3.4 being personal
  - 1.3.5 empathy
  - 1.3.6 positive attitude
  - 1.3.7 situational context
  - 1.3.8 perception
  - 1.3.9 appearance
  - 1.3.10 feedback
  - 1.3.11 listening
  - 1.3.12 thinking before you speak
- 1.4 describe modes of communication, including:
  - 1.4.1 one-way communications; e.g., speeches, lectures, TV or radio broadcasts, advertisements, books, magazines, body language and gestures
  - 1.4.2 two-way communications; e.g., in-person communication, telephone conversations, chat rooms, instant messaging or emails, texting, letters

2. apply verbal communication skills

2.1 identify verbal communication skills, including:
- 2.1.1 goals of communication; e.g., inform, command, instruct, inquire, persuade, develop goodwill, enhance relationships
- 2.1.2 verbal elements; e.g., speaking clearly and concisely and using correct pronunciation
- 2.1.3 vocal elements; e.g., tone of voice and inflection
- 2.1.4 visual elements; e.g., body language, facial expressions, gestures
- 2.1.5 advantages of verbal communication; e.g., emphasis, more personal and immediate feedback
- 2.1.6 disadvantages of verbal communication; e.g., no record of communication and lack of advance planning
- 2.1.7 challenges for sender; e.g., nervousness, maintaining eye contact, distractions
- 2.1.8 challenges for listener; e.g., distractions, negative attitudes, lack of subject knowledge

2.2 identify effective listening skills, including:
- 2.2.1 attention to or striving to understand what is heard
- 2.2.2 three basic listening styles of active listening, passive listening and combative listening
- 2.2.3 barriers to effective listening; e.g., negative emotions, fatigue, external and internal distractions, disinterest and lack of personal preparation

2.3 describe the relationship between verbal communication and interpersonal/customer relations, including establishing:
- 2.3.1 rapport
- 2.3.2 confidence
- 2.3.3 organized thinking

2.4 use verbal communication skills to deliver a presentation

3. apply written communication skills

3.1 identify when and why a specific form of written communication is used, including:
- 3.1.1 requirement of a permanent record of communication is required
- 3.1.2 lengthy, detailed instructions that can be referred to again are needed
- 3.1.3 same information needs to be sent to different geographical locations
- 3.1.4 immediate feedback is not required

3.2 organize written information, including:
- 3.2.1 deciding which written form to use, such as a letter, memorandum, email, report
- 3.2.2 planning what to write so that there is clear purpose and the message achieves the initial objective
- 3.2.3 composing a rough draft that can be revised and edited to produce a final draft

3.3 describe the relationship between written communication and interpersonal/customer relations, including:
- 3.3.1 emails
- 3.3.2 letter to and/or from customers
- 3.3.3 faxes

4. demonstrate basic competencies

4.1 demonstrate fundamental skills to:

- 4.1.1 communicate
- 4.1.2 manage information
- 4.1.3 use numbers
- 4.1.4 think and solve problems

4.2 demonstrate personal management skills to:

- 4.2.1 demonstrate positive attitudes and behaviours
- 4.2.2 be responsible
- 4.2.3 be adaptable
- 4.2.4 learn continuously
- 4.2.5 work safely

4.3 demonstrate teamwork skills to:

- 4.3.1 work with others
- 4.3.2 participate in projects and tasks

5. create a transitional strategy to accommodate personal changes and build personal values

5.1 identify short-term and long-term goals

5.2 identify steps to achieve goals

COURSE PTA3445: CUSTOMER SERVICE

Level: First Period Apprenticeship

Prerequisite: PTA3440: Communication
PTA3900: Apprenticeship Safety

Description: Students develop knowledge, skills and attitudes in conflict resolution, customer service and sales techniques.

Parameters: Access to a materials work centre, complete with basic hand and power tools, and to instruction from an individual with journeyperson certification as a parts technician.

ILM Resources: Conflict Resolution 270104d; Customer Service 270104e; Sales Techniques 270104f

Outcomes: The student will:

1. discuss conflict resolution strategies

1.1 define conflict, including:
- 1.1.1 disagreement between parties
- 1.1.2 opposition
- 1.1.3 differing needs, values, motives or interests
- 1.1.4 personality clashes
- 1.1.5 poor performance
- 1.1.6 limited resources
- 1.1.7 breach of trust

1.2 describe conflict resolution strategies, including:
- 1.2.1 take time to think
- 1.2.2 gather information
- 1.2.3 address the feelings
- 1.2.4 present possible solutions
- 1.2.5 agree on a solution
- 1.2.6 follow up

1.3 describe the advantages of conflict, including:
- 1.3.1 improved communications
- 1.3.2 use of creative thinking strategies
- 1.3.3 improved productivity
- 1.3.4 enhanced sense of teamwork

1.4 describe the disadvantages of conflict, including:
- 1.4.1 litigation
- 1.4.2 strikes
- 1.4.3 reduced productivity
- 1.4.4 poor morale
- 1.4.5 wasted time and resources
- 1.4.6 loss of team spirit
- 1.4.7 divided organizations

2. identify the goals of customer service

2.1 describe approaches used to provide customer service, including:
- 2.1.1 the three core elements of customer services: availability, reliability and convenience
- 2.1.2 customer rights, such as right product, right quantity and right price
- 2.1.3 quality customer service
- 2.1.4 appearance
- 2.1.5 greeting or acknowledging the customer, and interacting with the customer
- 2.1.6 serving customers with special needs

2.2 discuss customer expectations, including:
- 2.2.1 personal service
- 2.2.2 honesty
- 2.2.3 options
- 2.2.4 cleanliness
- 2.2.5 to be heard
- 2.2.6 to be informed

2.3 describe the impact of customer service, including:
- 2.3.1 customer satisfaction level
- 2.3.2 customer increase or decrease
- 2.3.3 customer retention

3. describe sales techniques

3.1 describe the attributes of a salesperson, including:
- 3.1.1 professionalism
- 3.1.2 patience
- 3.1.3 honesty
- 3.1.4 knowledge
- 3.1.5 listening skills
- 3.1.6 empathy
- 3.1.7 optimism
- 3.1.8 punctuality
- 3.1.9 flexibility
- 3.1.10 ethical
- 3.1.11 good communication skills
- 3.1.12 self-awareness
- 3.1.13 organizational skills

3.2 identify sales methods, including:
- 3.2.1 preparation, research or preapproach
- 3.2.2 approach or introduction
- 3.2.3 exploration, interest or qualifying
- 3.2.4 presentation
- 3.2.5 dealing with objections or negotiation
- 3.2.6 closing
- 3.2.7 follow-up and/or related sales

3.3 describe basic sales psychology, including:
- 3.3.1 knowing the five main factors that influence people's buying decision: need, product, source, price and timing
- 3.3.2 understanding Maslow's hierarchy of needs that consist of psychological, safety/security, social/love, esteem and self-actualization
- 3.3.3 understanding the customer's three fears of buying: expectations, cost and approval

3.4 identify sales leads, including:
- 3.4.1 networking
- 3.4.2 referrals
- 3.4.3 friends and acquaintances
- 3.4.4 telemarketing and advertising
- 3.4.5 computer databases
- 3.4.6 cold calls
- 3.4.7 directories or trade publications
- 3.4.8 trade shows

3.5 describe techniques for closing sales, including:
- 3.5.1 direct close
- 3.5.2 choice close
- 3.5.3 assumptive close
- 3.5.4 example close
- 3.5.5 objection close
- 3.5.6 special concession or added benefits close
- 3.5.7 summary close

4. demonstrate basic competencies

4.1 demonstrate fundamental skills to:
- 4.1.1 communicate
- 4.1.2 manage information
- 4.1.3 use numbers
- 4.1.4 think and solve problems

4.2 demonstrate personal management skills to:
- 4.2.1 demonstrate positive attitudes and behaviours
- 4.2.2 be responsible
- 4.2.3 be adaptable
- 4.2.4 learn continuously
- 4.2.5 work safely

4.3 demonstrate teamwork skills to:
- 4.3.1 work with others
- 4.3.2 participate in projects and tasks

5. create a transitional strategy to accommodate personal changes and build personal values

5.1 identify short-term and long-term goals

5.2 identify steps to achieve goals

COURSE PTA3450: PTA PRACTICUM A

Level: First Period Apprenticeship

Prerequisite: None

Description: Students, on the work site, continue to develop and refine those competencies developed in related Career and Technology Studies (CTS) occupational areas, previous practicums and other experiences.

Parameters: This course should be accessed only by students continuing to work toward attaining a recognized credential offered by an agency external to the school. Practicum courses extend the competencies developed in related CTS occupational areas. The practicum courses may not be delivered as stand-alone courses and may not be combined with core courses. This course may not be used in conjunction with Registered Apprenticeship Program courses. This practicum course may be delivered on- or off-campus. Instruction must be delivered by a qualified teacher with journeyperson certification or an experienced professional with journeyperson certification, who is under the supervision of the qualified teacher; both must be authorized to supervise trainees for the external credential.

Outcomes: The student will:

1. **perform assigned tasks and responsibilities efficiently and effectively, as required by the agency granting credentials**
   - 1.1 identify regulations and regulatory bodies related to the credential
   - 1.2 describe personal roles and responsibilities, including:
     - 1.2.1 key responsibilities
     - 1.2.2 support functions/responsibilities
     - 1.2.3 code of ethics
   - 1.3 describe personal work responsibilities and categorize them as:
     - 1.3.1 routine tasks; e.g., daily, weekly, monthly, yearly
     - 1.3.2 non-routine tasks; e.g., emergencies
     - 1.3.3 tasks requiring personal judgement
     - 1.3.4 tasks requiring approval of a supervisor
2. **analyze personal performance in relation to established standards**
   - 2.1 evaluate application of competencies developed in related CTS courses
   - 2.2 evaluate standards of performance in terms of:
     - 2.2.1 quality of work
     - 2.2.2 quantity of work
   - 2.3 evaluate adherence to workplace policies and procedures related to health and safety
   - 2.4 evaluate the work environment in terms of:
     - 2.4.1 location
     - 2.4.2 floor plan of work area
     - 2.4.3 analysis of workflow patterns

2.5 evaluate a professional in a related occupation in terms of:
    2.5.1 training and certification
    2.5.2 interpersonal skills
    2.5.3 technical skills
    2.5.4 professional ethics

3. demonstrate basic competencies

3.1 demonstrate fundamental skills to:
    3.1.1 communicate
    3.1.2 manage information
    3.1.3 use numbers
    3.1.4 think and solve problems
3.2 demonstrate personal management skills to:
    3.2.1 demonstrate positive attitudes and behaviours
    3.2.2 be responsible
    3.2.3 be adaptable
    3.2.4 learn continuously
    3.2.5 work safely
3.3 demonstrate teamwork skills to:
    3.3.1 work with others
    3.3.2 participate in projects and tasks

COURSE PTA3455: PTA PRACTICUM B

Level: First Period Apprenticeship

Prerequisite: None

Description: Students, on the work site, continue to develop and refine those competencies developed in related Career and Technology Studies (CTS) occupational areas, previous practicums and other experiences.

Parameters: This course should be accessed only by students continuing to work toward attaining a recognized credential offered by an agency external to the school. Practicum courses extend the competencies developed in related CTS occupational areas. The practicum courses may not be delivered as stand-alone courses and may not be combined with core courses. This course may not be used in conjunction with Registered Apprenticeship Program courses. This practicum course may be delivered on- or off-campus. Instruction must be delivered by a qualified teacher with journeyperson certification or an experienced professional with journeyperson certification, who is under the supervision of the qualified teacher; both must be authorized to supervise trainees for the external credential.

Outcomes: The student will:

1. **perform assigned tasks and responsibilities efficiently and effectively, as required by the agency granting credentials**
   - 1.1 identify regulations and regulatory bodies related to the credential
   - 1.2 describe personal roles and responsibilities, including:
     - 1.2.1 key responsibilities
     - 1.2.2 support functions/responsibilities
     - 1.2.3 code of ethics
   - 1.3 describe personal work responsibilities and categorize them as:
     - 1.3.1 routine tasks; e.g., daily, weekly, monthly, yearly
     - 1.3.2 non-routine tasks; e.g., emergencies
     - 1.3.3 tasks requiring personal judgement
     - 1.3.4 tasks requiring approval of a supervisor
2. **analyze personal performance in relation to established standards**
   - 2.1 evaluate application of competencies developed in related CTS courses
   - 2.2 evaluate standards of performance in terms of:
     - 2.2.1 quality of work
     - 2.2.2 quantity of work
   - 2.3 evaluate adherence to workplace policies and procedures related to health and safety
   - 2.4 evaluate the work environment in terms of:
     - 2.4.1 location
     - 2.4.2 floor plan of work area
     - 2.4.3 analysis of workflow patterns

2.5 evaluate a professional in a related occupation in terms of:
    2.5.1 training and certification
    2.5.2 interpersonal skills
    2.5.3 technical skills
    2.5.4 professional ethics

3. demonstrate basic competencies

3.1 demonstrate fundamental skills to:
    3.1.1 communicate
    3.1.2 manage information
    3.1.3 use numbers
    3.1.4 think and solve problems
3.2 demonstrate personal management skills to:
    3.2.1 demonstrate positive attitudes and behaviours
    3.2.2 be responsible
    3.2.3 be adaptable
    3.2.4 learn continuously
    3.2.5 work safely
3.3 demonstrate teamwork skills to:
    3.3.1 work with others
    3.3.2 participate in projects and tasks

COURSE PTA3460: PTA PRACTICUM C

Level: First Period Apprenticeship

Prerequisite: None

Description: Students, on the work site, continue to develop and refine those competencies developed in related Career and Technology Studies (CTS) occupational areas, previous practicums and other experiences.

Parameters: This course should be accessed only by students continuing to work toward attaining a recognized credential offered by an agency external to the school. Practicum courses extend the competencies developed in related CTS occupational areas. The practicum courses may not be delivered as stand-alone courses and may not be combined with core courses. This course may not be used in conjunction with Registered Apprenticeship Program courses. This practicum course may be delivered on- or off-campus. Instruction must be delivered by a qualified teacher with journeyperson certification or an experienced professional with journeyperson certification, who is under the supervision of the qualified teacher; both must be authorized to supervise trainees for the external credential.

Outcomes: The student will:

1. **perform assigned tasks and responsibilities efficiently and effectively, as required by the agency granting credentials**
   - 1.1 identify regulations and regulatory bodies related to the credential
   - 1.2 describe personal roles and responsibilities, including:
     - 1.2.1 key responsibilities
     - 1.2.2 support functions/responsibilities
     - 1.2.3 code of ethics
   - 1.3 describe personal work responsibilities and categorize them as:
     - 1.3.1 routine tasks; e.g., daily, weekly, monthly, yearly
     - 1.3.2 non-routine tasks; e.g., emergencies
     - 1.3.3 tasks requiring personal judgement
     - 1.3.4 tasks requiring approval of a supervisor
2. **analyze personal performance in relation to established standards**
   - 2.1 evaluate application of competencies developed in related CTS courses
   - 2.2 evaluate standards of performance in terms of:
     - 2.2.1 quality of work
     - 2.2.2 quantity of work
   - 2.3 evaluate adherence to workplace policies and procedures related to health and safety
   - 2.4 evaluate the work environment in terms of:
     - 2.4.1 location
     - 2.4.2 floor plan of work area
     - 2.4.3 analysis of workflow patterns

2.5 evaluate a professional in a related occupation in terms of:
- 2.5.1 training and certification
- 2.5.2 interpersonal skills
- 2.5.3 technical skills
- 2.5.4 professional ethics

3. demonstrate basic competencies

3.1 demonstrate fundamental skills to:
- 3.1.1 communicate
- 3.1.2 manage information
- 3.1.3 use numbers
- 3.1.4 think and solve problems

3.2 demonstrate personal management skills to:
- 3.2.1 demonstrate positive attitudes and behaviours
- 3.2.2 be responsible
- 3.2.3 be adaptable
- 3.2.4 learn continuously
- 3.2.5 work safely

3.3 demonstrate teamwork skills to:
- 3.3.1 work with others
- 3.3.2 participate in projects and tasks

COURSE PTA3465: PTA PRACTICUM D

Level: First Period Apprenticeship

Prerequisite: None

Description: Students, on the work site, continue to develop and refine those competencies developed in related Career and Technology Studies (CTS) occupational areas, previous practicums and other experiences.

Parameters: This course should be accessed only by students continuing to work toward attaining a recognized credential offered by an agency external to the school. Practicum courses extend the competencies developed in related CTS occupational areas. The practicum courses may not be delivered as stand-alone courses and may not be combined with core courses. This course may not be used in conjunction with Registered Apprenticeship Program courses. This practicum course may be delivered on- or off-campus. Instruction must be delivered by a qualified teacher with journeyperson certification or an experienced professional with journeyperson certification, who is under the supervision of the qualified teacher; both must be authorized to supervise trainees for the external credential.

Outcomes: The student will:

1. **perform assigned tasks and responsibilities efficiently and effectively, as required by the agency granting credentials**
   - 1.1 identify regulations and regulatory bodies related to the credential
   - 1.2 describe personal roles and responsibilities, including:
     - 1.2.1 key responsibilities
     - 1.2.2 support functions/responsibilities
     - 1.2.3 code of ethics
   - 1.3 describe personal work responsibilities and categorize them as:
     - 1.3.1 routine tasks; e.g., daily, weekly, monthly, yearly
     - 1.3.2 non-routine tasks; e.g., emergencies
     - 1.3.3 tasks requiring personal judgement
     - 1.3.4 tasks requiring approval of a supervisor
2. **analyze personal performance in relation to established standards**
   - 2.1 evaluate application of competencies developed in related CTS courses
   - 2.2 evaluate standards of performance in terms of:
     - 2.2.1 quality of work
     - 2.2.2 quantity of work
   - 2.3 evaluate adherence to workplace policies and procedures related to health and safety
   - 2.4 evaluate the work environment in terms of:
     - 2.4.1 location
     - 2.4.2 floor plan of work area
     - 2.4.3 analysis of workflow patterns

2.5 evaluate a professional in a related occupation in terms of:
- 2.5.1 training and certification
- 2.5.2 interpersonal skills
- 2.5.3 technical skills
- 2.5.4 professional ethics

3. demonstrate basic competencies

3.1 demonstrate fundamental skills to:
- 3.1.1 communicate
- 3.1.2 manage information
- 3.1.3 use numbers
- 3.1.4 think and solve problems

3.2 demonstrate personal management skills to:
- 3.2.1 demonstrate positive attitudes and behaviours
- 3.2.2 be responsible
- 3.2.3 be adaptable
- 3.2.4 learn continuously
- 3.2.5 work safely

3.3 demonstrate teamwork skills to:
- 3.3.1 work with others
- 3.3.2 participate in projects and tasks

COURSE PTA3900: APPRENTICESHIP SAFETY

Level: First Period Apprenticeship

Prerequisite: None

Description: Students develop knowledge, skills and attitudes in the practice of workshop health and safety, communication and career planning.

Parameters: Access to a materials work centre and to instruction from an individual with specialized training in occupational health and safety (and understanding of the parts industry) and/or a parts technician with journeyperson certification.

ILM Resources: Safety Legislation, Regulations and Industry Policy in the Trades 650101a (270101a); Climbing, Lifting, Rigging and Hoisting 650101b (270101b); Hazardous Materials and Fire Protection 650101c (270101c); Environmental Protection 270101d; Communication 090101d

Note: This course may promote discussions around sensitive topics (e.g., injury and death) in the context of student safety with respect to workplace hazards.

Outcomes: The student will:

1. describe legislation, regulations and practices intended to ensure a safe workplace in the parts technician apprenticeship trade

- 1.1 demonstrate the ability to apply the *Occupational Health and Safety Act (OHS), Regulation* and *Code*, as well as the changes from Bill C-45
- 1.2 explain the core requirements applicable to all industries, including:
  - 1.2.1 engineering controls
  - 1.2.2 administrative controls
  - 1.2.3 personal protective equipment (PPE)
- 1.3 demonstrate an understanding of the 26 parts of the OHS Code requirements applicable to all industries
- 1.4 demonstrate an understanding of the 12 parts of the OHS Code requirements applicable to specific industries and activities
- 1.5 demonstrate an understanding of the 11 OHS Code Schedules that the Explanation Guide does not address
- 1.6 explain the role of the employer and employee in regard to occupational health and safety legislation, considering:
  - 1.6.1 employer responsibilities (OHS Regulation)
  - 1.6.2 employee responsibilities (OHS Regulation)
  - 1.6.3 Workplace Hazardous Materials Information System (WHMIS)
  - 1.6.4 fire regulations
  - 1.6.5 Workers' Compensation Board (WCB)
  - 1.6.6 related advisory bodies and agencies; e.g., Alberta Construction Safety Association (ACSA), Construction Owners Association of Alberta (COAA), Occupational Health and Safety Council (OHSC), Work Safe Alberta, Safety Codes Council

1.7 explain industry practices for hazard assessment and control procedures in four main hazard categories, including:
    1.7.1 biological
    1.7.2 chemical
    1.7.3 ergonomic
    1.7.4 physical hazards
1.8 identify and describe hazard assessment tools that both employees and employers must use in assessing and controlling work-site hazards, including:
    1.8.1 work-site hazard identification and assessment
    1.8.2 health and safety plan
    1.8.3 joint work-site health and safety committee
    1.8.4 emergency response plans
    1.8.5 first-aid and incident reports
1.9 identify and describe engineering controls that provide the highest level of worker protection, including:
    1.9.1 elimination
    1.9.2 substitution
    1.9.3 redesign
    1.9.4 isolation
    1.9.5 automation
1.10 identify and describe employer administrative controls that limit hazards to the lowest level possible, including:
    1.10.1 safe work practices
    1.10.2 job procedures, policies, rules
    1.10.3 work/rest schedules to reduce exposure
    1.10.4 limiting hours of work
    1.10.5 scheduling hazardous work during non-peak times
    1.10.6 using optional methods
1.11 describe the responsibilities of employees and employers to apply emergency procedures, including:
    1.11.1 emergency response plans
    1.11.2 first aid
1.12 describe positive tradesperson attitudes with respect to legal responsibilities for all workers, including:
    1.12.1 housekeeping
    1.12.2 lighting
    1.12.3 personal protective equipment (PPE)
    1.12.4 emergency procedures
1.13 describe the roles and responsibilities of employers and employees with respect to the selection and use of personal protective equipment (PPE), including:
    1.13.1 eye protection; e.g., class 1 (spectacles), class 2 (goggles), class 3 (welding helmets), class 4 (welding hand shields), class 5 (hoods), class 6 (face shields), class 7 (respirator face pieces)
    1.13.2 flame resistant clothing
    1.13.3 foot protection; e.g., category 1, 2 or 3 footwear requirements
    1.13.4 head protection; e.g., class G (general), class E (electrical), class C (conducting)
    1.13.5 hearing protection; e.g., earplugs or earmuffs
    1.13.6 life jackets and personal flotation devices (PFDs)

1.13.7 limb and body protection
1.13.8 respiratory protective equipment; e.g., particulate filters; chemical cartridges or canisters; airline respirators, hoods, helmets and suits; self-contained breathing apparatus (SCBA)
1.13.9 a combination of any of the above

2. describe the use of personal protective equipment (PPE) and safe practices for climbing, lifting, rigging and hoisting in the parts technician apprenticeship trade

2.1 select, use and maintain specialized PPE and materials for climbing, lifting and loading, including:
2.1.1 full body harness
2.1.2 body belt
2.1.3 ladders
2.1.4 scaffold systems
2.1.5 lifting and moving equipment
2.1.6 PPE for lifting
2.1.7 materials handling equipment; e.g., forklift, four-wheel dolly, chain hoist, overhead crane

2.2 describe manual lifting procedures, including correct body mechanics, considering:
2.2.1 back safety
2.2.2 general procedure for lifting
2.2.3 employer and employee preventive actions to avoid back injuries

2.3 describe rigging hardware and the safe work load associated with:
2.3.1 wire rope slings
2.3.2 synthetic fibre web slings
2.3.3 chain slings
2.3.4 rigging hardware inspection

2.4 select the correct equipment for rigging typical loads, including:
2.4.1 eye bolts
2.4.2 shackles
2.4.3 rings and links
2.4.4 hooks
2.4.5 swivels
2.4.6 spreader bars and equalization beams
2.4.7 blocks
2.4.8 sheaves
2.4.9 turnbuckles

2.5 describe hoisting and load-moving procedures

2.6 explain the most commonly used sling configurations to connect a load to a hook, including:
2.6.1 vertical hitch
2.6.2 bridle hitch
2.6.3 single and double basket hitch
2.6.4 wrap hitch
2.6.5 single and double choker hitch

2.7 demonstrate the standard movement signals a signaler is required to know to signal a crane operator, including:
2.7.1 hoist and lower load
2.7.2 raise and lower boom
2.7.3 swing boom
2.7.4 stop
2.7.5 emergency stop
2.7.6 dog everything

3. describe the safety practices for hazardous materials and fire protection in the parts technician apprenticeship trade

- 3.1 describe the roles, responsibilities, features and practices related to the Workplace Hazardous Materials Information System (WHMIS) program, including:
  - 3.1.1 suppliers', employers' and employees' responsibilities
  - 3.1.2 WHMIS classifications
  - 3.1.3 health effects from exposure to chemicals
- 3.2 describe the three key elements of WHMIS, including:
  - 3.2.1 worker education
  - 3.2.2 supplier and workplace product labelling
  - 3.2.3 material safety data sheets
- 3.3 describe handling, storage and transportation procedures when dealing with hazardous material, including:
  - 3.3.1 handling, storing and transporting flammable liquids
  - 3.3.2 handling, storing and transporting compressed gas
  - 3.3.3 storing incompatible materials
- 3.4 describe safe venting procedures when working with hazardous materials, including:
  - 3.4.1 mechanical general ventilation
  - 3.4.2 local ventilation
  - 3.4.3 portable smoke extractor
  - 3.4.4 working in a confined space
- 3.5 describe fire hazards, classes, procedures and equipment related to fire protection, including:
  - 3.5.1 elements of a fire
  - 3.5.2 classes of fires
  - 3.5.3 fire extinguisher labels
  - 3.5.4 extinguishing small fires
  - 3.5.5 the PASS method

4. demonstrate communication skills and workshop safety as they pertain to occupational health and safety standards

- 4.1 use various types of communication to provide trade-related information, employing standard terms for components and operations, including:
  - 4.1.1 personal appearance
  - 4.1.2 business appearance
  - 4.1.3 suppliers and sales representatives
  - 4.1.4 customers
  - 4.1.5 tradespeople
- 4.2 identify key areas of responsibility that an employee has in regards to shop and trade safety, including:
  - 4.2.1 housekeeping
  - 4.2.2 waste containers
  - 4.2.3 power tools and rotating machinery
  - 4.2.4 compressed air
  - 4.2.5 exhaust gases
  - 4.2.6 control of carbon monoxide (CO)
  - 4.2.7 hazardous materials, dangerous goods and controlled products
- 4.3 explain the correct use of fire extinguishers and explain fire prevention techniques

5. demonstrate an understanding of the parts technician apprenticeship trade and of apprenticeship opportunities that exist by creating a personal career portfolio

- 5.1 demonstrate an understanding of the parts technician apprenticeship trade and related job opportunities
- 5.2 describe what it means to be an apprentice and describe requirements for the employee and employer
- 5.3 describe Alberta's apprenticeship and industry training system
- 5.4 describe the roles and responsibilities of the Alberta Apprenticeship and Industry Training Board, government and post-secondary institutions
- 5.5 describe the roles and responsibilities of the provincial apprenticeship committees (PAC), local apprenticeship committees (LAC) and occupational committees
- 5.6 refine and present a personal career portfolio, showing evidence of strengths and competencies, including:
  - 5.6.1 application completion
  - 5.6.2 cover letter
  - 5.6.3 résumé with references
- 5.7 demonstrate knowledge of workplace requirements, rights and responsibilities and relate this knowledge to personal career/employment expectations
- 5.8 outline the educational requirements to move into the parts technician apprenticeship trade and:
  - 5.8.1 conduct successful employment searches
  - 5.8.2 communicate in the language in which business is conducted
  - 5.8.3 prepare a personal employment search portfolio
  - 5.8.4 use technologies, tools and information systems appropriately for job preparation

6. adhere to environmental protection legislation

- 6.1 describe environmentally sound practices and procedures at the work site, including:
  - 6.1.1 hazardous and non-hazardous waste disposal and the Alberta Environmental Protection Agency (AEPA)
  - 6.1.2 recycling programs
  - 6.1.3 energy conservation and efficiency
  - 6.1.4 water conservation and efficiency
  - 6.1.5 land conservation
  - 6.1.6 air conservation
- 6.2 outline the compliance requirements of current legislation and hazardous waste regulations, including:
  - 6.2.1 the *Alberta Environmental Protection and Enhancement Act (AEPEA)*
  - 6.2.2 the *Transportation of Dangerous Goods Act (TDG)*
  - 6.2.3 the *Hazardous Products Act*
  - 6.2.4 the Chemical Hazards Regulation as part of the Occupational Health and Safety Code
  - 6.2.5 the Alberta Used Oil Management Association (AUOMA)
- 6.3 describe strategies to reduce waste generated at the work site, including:
  - 6.3.1 waste reduction
  - 6.3.2 waste reuse
  - 6.3.3 waste recycle
  - 6.3.4 waste disposal
- 6.4 explain spill prevention and spill containment strategies, including:
  - 6.4.1 spill kits
  - 6.4.2 absorbents
  - 6.4.3 skimmers and filtration equipment
  - 6.4.4 spill decks, pallets and trays
  - 6.4.5 storage, dispensing and transportation products

6.5 explain release prevention and containment strategies, including:
- 6.5.1 indoor air quality monitoring
- 6.5.2 use of firewalls
- 6.5.3 proper signage
- 6.5.4 emergency alarms

7. demonstrate basic competencies

7.1 demonstrate fundamental skills to:
- 7.1.1 communicate
- 7.1.2 manage information
- 7.1.3 use numbers
- 7.1.4 think and solve problems

7.2 demonstrate personal management skills to:
- 7.2.1 demonstrate positive attitudes and behaviours
- 7.2.2 be responsible
- 7.2.3 be adaptable
- 7.2.4 learn continuously
- 7.2.5 work safely

7.3 demonstrate teamwork skills to:
- 7.3.1 work with others
- 7.3.2 participate in projects and tasks

8. create a transitional strategy to accommodate personal changes and build personal values

8.1 identify short-term and long-term goals

8.2 identify steps to achieve goals