

YA Manufacturing to RA Maintenance Technician Competency Crosswalk

This document is intended to serve as a guide for manufacturing employers and instructors when comparing the work skills of youth apprentices to those required of registered apprentices in the Maintenance Technician program. It compares the Maintenance Technician Apprenticeship On-the-Job Training Core (Job Book) with the Required Skills Curriculum of the Manufacturing Youth Apprenticeship Program (Competency Checklist). The manufacturing employer and technical college instructor have the authority to make final determinations of advanced credit awarded to Youth Apprenticeship Program graduates.

Keep the following in mind when evaluating the Manufacturing Youth Apprenticeship Program:

- Manufacturing YA Units 1, 2, 3 must be completed by all Manufacturing YA students. Students must also complete one of Units 4-9, or two of these units for a Level Two YA student.
- Students are allowed to mix and match any of Units 4-9 within the Manufacturing Cluster, at the discretion of their employer.
- Manufacturing YA Unit 6 (Machining) applies to one of the following machines: Grinder, Machine Center, or Lathe. A Level Two Machining YA student would complete Unit 6 again for a different process. They would not be expected by state standards to know all three machines, although the employer may train them in additional competencies if appropriate
- Competencies from all Manufacturing YA Units are included when appropriate, but youth apprentices following the Maintenance, Installation and Repair Pathway (Units 9 and 10) are the best match with the RA Maintenance Technician program.

The required Manufacturing YA units are listed at the end of the document (Appendix A).

1. Maintain Safe Working Practices through Use of Safety Guidelines

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Interpret and apply Occupational Health and Safety Act (OSHA) standards to identify and use safe working practices on industrial sites.	2(1) Required Skills – Safety - Follow personal safety requirements -
Lock out and tag out electrical and mechanical equipment according to applicable codes and company procedures.	3(3) Required Skills – Manufacturing Fundamentals - Operate tools and equipment safely – Follow Lock Out/Tag Out procedures
Select for site conditions and locations, inspect, maintain and use elevating platforms and devices; such as personnel lifts, scissor lifts, bucket lifts, and swing stages to install and repair equipment installations according to government regulations, site conditions, and company safety standards.	N/A – Hoists prohibited to youth apprentices
Identify hazardous conditions, equipment, and materials and report or correct according to OSHA and company procedures	2(1) Required Skills - Safety - Follow personal safety requirements – handle and dispose of any hazardous materials appropriately
Have an understanding of NFPA 70E Arc Flash (blast) tables, PPE, cabinet labels, and safe operating procedures.	3(3) Required Skills –Manufacturing Fundamentals – Operate tools and equipment safely - Wear the required Personal Protective Equipment (PPE) at all times as required for the operation of the tool/equipment
Maintain a current CPR and First Aid Certificate and administer CPR and first aid as required on the job site according to site and company procedures.	2(3) Required skills – Safety - Demonstrate professional role to be used in an emergency - Detail steps to use in medical emergencies requiring First Aid, CPR, and/or Heimlich maneuver

Identify, select, and use hand and power tools and equipment for intended purpose in accordance with OSHA, manufacturer's instructions, and company procedures.	2(1) Follow personal safety requirements – follow all worksite guidelines for proper safety
Select, wear, adjust, and maintain protective clothing and equipment in accordance with OSHA and company procedures.	2(1) Follow personal safety requirements – follow all worksite guidelines for proper safety
Work safely within confined spaces in accordance with OSHA and company procedures and standards.	2(1) Follow personal safety requirements – follow all worksite guidelines for proper safety
Work safely within the defined robotic envelope according to applicable OSHA, manufacturer and company procedures.	2(1) Follow personal safety requirements – follow all worksite guidelines for proper safety
Interpret and apply safe housekeeping practices according to OSHA and company practices to maintain a safe work area.	2(2) Maintain a safe work environment – assess need for good housekeeping practices
Work within safe physical limits by lifting, climbing and working in accordance with OSHA and company procedures and standards.	2(1) Follow personal safety requirements – describe proper techniques for lifting loads
Understand and apply company/employer safety guidelines.	

2. Select, Maintain, and Properly Use Tools and Equipment

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Select and use power tools and apparatus for the job it is intended, maintain power tools in good working order according to manufacturer's specifications, company standards, and health and safety rules and regulations.	
Select and use hand tools and equipment for the job it was intended, maintain hand tools in good working order to manufacturer's specifications, company standards, and health and safety rules and regulations.	9(8) Industrial Equipment – Basic - Use hand tools – cut metal stock with a hand hacksaw, cut threads with hand taps and dies, ream holes with hand reamer, tap holes using hand tools, deburr using hand tools
Perform routine maintenance on tools and equipment as to age of equipment maintaining a complete record of repairs, reporting of tools which are not in working condition, ensure that tools are in safe working order according to manufacturer's specifications and company standards.	9(4) Industrial Equipment – Basic - Monitor equipment for correct operation 9(13) Assist to re-qualify equipment 10(11) Assist to install and qualify equipment – test and validate the equipment operationally for all types of applications, stresses, and routine operation
Selection and safe use of electronic/electrical measurement and test equipment in accordance with manufacturer's recommendations, company standard and common safety practices.	10(1) Maintenance Installation, and Repair Pathway Industrial Equipment- Advanced - Calibrate tools and equipment
Select, use, maintain, and inspect rigging and hoisting equipment of adequate size for the site location and conditions. Be able to use hand and voice signals according to company standards. Maintain the rigging and hoisting equipment in good working order according to manufacturer's specifications, company standards, and health and safety rules and regulations.	

3. Install and Maintain Machine Power Distribution

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Apply industrial and commercial installation practices to install, maintain, and repair wiring systems to quality standards, building codes, COM 16, NFPA 70 and 79, company procedures, and site requirements.	10(9) Maintain and repair electrical control system components – replace faulty lighting components, replace blown fuse or tripped circuit breaker, construct common control circuits using switches and relays, assist to adjust faulty circuit components, assist to install conduit and wiring
Select, layout, and install branch circuit wiring to install, maintain, and repair wiring systems to quality standards, NEC, building codes, company procedures, and site requirements.	
Select, layout, and install feeder cable in accordance with the NEC, building codes, circuit loadings, environmental conditions, plans and specifications to meet the installation's requirements, good standards of professionalism, and company standards.	
Select, layout, and install conduit and raceway systems in accordance with the NEC, building codes, circuit loadings, environmental conditions, plans and specifications to meet the installation's requirements, good standards of professionalism, and company standards.	
Select, layout, and install electric heating systems in accordance with the heat loss calculation, NEC, building codes, circuit loadings, environmental conditions, plans and specifications to meet the installation's requirements, good standards of workmanship, and company standards.	
Select, layout, and install wiring for each Class-division for hazardous locations in accordance with the NEC, building codes, circuit loadings, environmental conditions, plans, and specifications to meet the installation's requirements, good standards of workmanship, and company standards.	
Select and apply grounding and bonding procedures to provide grounding and bonding connections for power distribution and lighting systems using approved fittings for ground conductors as specified in the NEC, manufacturer's requirements, and company standards.	

4. Electrical Installation and Maintenance of Industrial Machinery and Equipment

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Select, install, and maintain relays, solid state devices, and controls by determining the control requirements; selecting, laying out, and installing relays and solid state devices, and perform maintenance and troubleshooting per manufacturer's and company standards.	10(9) Maintain and repair electrical control system components – replace faulty lighting components, replace blown fuse or tripped circuit breaker, construct common control circuits using switches and relays, assist to adjust faulty circuit components, assist to install conduit and wiring
Select, assemble, and wire control panels, enclosures, and control devices to verify operation and ensure that the installation meets NEC requirements, manufacturer's requirements, and company standards.	
Demonstrate understanding by installing PLC hardware and software in accordance with the NEC, manufacturer's specifications and procedures, and company specifications and procedures.	10(6) Assist with motor control problem identification and diagnosis – Describe automated machine reliability issues, including computerized control processes, logic control circuits, solenoid-operated fluid power valves, electromechanical limit switches, time delay devices, manual controls, and interlock circuits
Select, install, and maintain protection and interlocking devices by determining the control requirements; selecting, layout, and installing protection devices; performing maintenance, and troubleshooting sequence for control systems in accordance with the NEC, manufacturer's, and company standards.	
Select and apply grounding and bonding procedures to provide grounding and bonding connections for industrial machinery and equipment, to include panel building and using approved fitting and ground conductors as specified in NEC, manufacturer's requirements, and company standards.	10(9) Maintain and repair electrical control system components – explain ground requirements

5. Install and Maintain Material Handling Equipment, Welding Equipment, and Robotics

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Select, layout, and install welding related equipment, as per manufacturer's specifications, NEC requirements, and accepted installation and maintenance practices.	
Select, layout, and install electro-mechanical and/or solid state motor starting devices as per nameplate, site conditions, and control requirements as per manufacturer's specifications, NEC requirements, and accepted installation and maintenance practices.	
Select, layout, install, and maintain DC motors, electro-mechanical and solid state drives by ensuring that overload relays are properly sized and wired into circuit, checking all circuit protective devices, ensuring that external	

control wiring has been verified. Record any changes on control diagrams, verifying voltage and current on starting and running cycles on each phase of supply circuit.	
Select, layout, install, and maintain AC variable frequency motors and drives by ensuring that overload relays are properly sized and wired into circuit, checking all circuit protective devices, ensuring that external control wiring voltage and current on starting and running cycles on each phase of supply circuit, checking rotation of motors.	
Select and install intrinsic safe barriers to provide proper isolation in accordance with NEC, manufacturer, and company specifications.	
Test and apply hydraulic and pneumatic theory in accordance with company procedures and manufacturer's specifications.	
Layout and install isolated grounding computer installations in accordance with the NEC, manufacturer's requirements, and company standards.	
Demonstrate understanding of preventative maintenance techniques (for MHE, welding equipment, and robotics) by performing preventative maintenance in accordance with manufacturer's specifications and company procedures.	7(16) Production – Welding – Perform routine preventative maintenance (PM) according to facility schedule, Assist worksite professional to follow PM schedule to calibrate and maintain equipment, tools and workstations
Select and apply grounding and bonding procedures to provide grounding and bonding connections for MHE, welding equipment, and robotics using approved fittings and ground conductors as specified in the NEC, manufacturer's requirements, and company standards.	

6. Install and Maintain General Plant Equipment

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Select and apply grounding and bonding procedures to provide grounding and bonding connections for general plant equipment using approved fittings for ground conductors as specified in the NEC, manufacturer's requirements, and company standards.	
Layout, select, and install branch circuit wiring to install, maintain, and repair wiring systems to quality standards, NEC, building codes, company procedures, and site requirements.	
Select and safely use electronic/electrical measurement and test equipment in accordance with manufacturer's recommendations, company standards, and common	

safety practices.	
Select, layout, and install conduit and raceway systems in accordance with the NEC, building codes, circuit loadings, environmental conditions, plans and specifications to meet the installation's requirements, good standards of workmanship, and company standards.	
Interpret and apply rules contained in the NEC to ensure that electrical work is done according to accepted industry standards and practices.	
Schedule electrical job site material requirements by locating and sequence of material requirements, reviewing delivery schedules, ensuring storage space is available, keeping a complete record of inventory of on-site materials, maintaining adequate supply on hand of basic items, according to government regulations, site specifications, and company standards.	8(1) Production Operations Management – assist to purchase materials and supplies - Explain the importance of tracking and documentation for inventory control and production processing, Store inventory received according to any special handling and production requirements
Select, install, and maintain instrumentation devices to ensure accuracy of digital readouts, choosing the testing equipment, calibration procedures, type of wiring network, and verification procedures in accordance with the manufacturer's specifications, NEC, and company standards.	
Layout and install power and energy metering/management systems equipment, such as overcurrent devices, ground fault sensors, power sensors, static voltage regulators, and remote field devices to maintain the design criteria as per manufacturer's and company requirements.	
Layout, install, and maintain uninterruptible power supply systems to provide emergency power by checking drawings of system and equipment, type of fuel, location of systems, starting and control of system, transfer switch(es), testing and maintenance in accordance with manufacturer's and company requirements.	
Install and maintain battery and/or stand-by systems to provide emergency power and illumination by checking drawings of system and equipment, type of fuel, location of systems, starting and control of systems, transfer switch(es), testing and maintenance in accordance with NEC, manufacturer's, and company requirements.	
Demonstrate understanding of preventative maintenance techniques for general plant equipment by performing preventative maintenance in accordance with manufacturer's specifications and company procedures.	3(3) Required Skills –Manufacturing Fundamentals – Operate tools and equipment safely - Explain the purpose and importance of preventative maintenance and calibration, Perform any required preventative maintenance procedures

7. Read, Interpret, and Revise Drawings and Specifications

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Read and interpret schematics and their symbols for hydraulic and pneumatic components.	9(1) Industrial Equipment – Basic - Read technical drawings and work orders 9(2) Industrial Equipment – Basic Interpret equipment symbols and procedures
Sketch and record as-built drawings to indicate all edits as indicated on the working drawings to the satisfaction of the engineer or company.	
Read and interpret mechanical plans and specifications to obtain an understanding of the details of the building's mechanical systems and any applicable codes to complete the electrical installation.	
Read and interpret power distribution drawings and specifications to obtain an understanding of the details of the building's power distribution system, the supply authority's requirements, and applicable codes to complete the electrical installation.	
Read and interpret instrumentation and communication drawings and specifications to obtain an understanding of the detail of the building's instrumentation and communication systems and applicable codes to complete the electrical installation.	
Read and interpret electrical plans and specifications to obtain an understanding of the detail of the building's electrical systems and applicable codes to complete the electrical installation.	
Read and interpret relay, solid state, and ladder logic diagrams and specifications to obtain an understanding of the details of the building's relay, solid state, and ladder logic diagrams and specifications to complete the electrical installation.	
Evaluate components from assembly drawings and interpret their intended functions.	
Edit drawings from a specific part assembly or layout to include all necessary dimensioning to applicable standards.	

8. Select, Install, and Maintain Motors, Motor Drives, and Controls

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Identify, select, and install motors to include grounding, as per nameplate and controls as per manufacturer's specifications, company requirements, NEC, and accepted installation and maintenance practices.	
Select, layout, and install electro-mechanical and/or solid state motor starting devices as per nameplate, site conditions, and control requirements as per manufacturer's specifications, NEC requirements, and accepted installation and maintenance practices.	
Layout, install, and maintain DC motors, electro-mechanical and solid state drives by ensuring that overload relays are properly sized and wired into circuit, checking all circuit protective devices, ensuring that external control wiring has been verified. Record any changes on control diagrams, verifying voltage and current on starting and running cycles on each phase of supply circuit, and checking rotation of motors.	
Demonstrate understanding of PM techniques of DC motors and generators in accordance with manufacturer's specifications and company procedures.	
Layout, install, and maintain AC variable frequency motors and drives by ensuring that overload relays are properly sized and wired into circuit, checking all circuit protective devices, ensuring that external control wiring voltage and current on starting and running cycles on each phase or supply circuit, checking rotation of motors.	
Align motors by checking proper tension, tolerance, and using appropriate measuring devices according to maintenance manuals and manufacturer's recommendations to ensure the correct alignment.	
Select, install, and maintain protection devices by determining the control requirements, selecting, laying out, and installing protection devices; perform maintenance and troubleshoot sequences for control systems in accordance with the NEC, manufacturer's, and company standards.	
Demonstrate proper rigging techniques for safely lifting motor for installation or removal.	

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Communicate with operators before services.	8(9) Production Operations Management – Assist to coordinate work schedules and duty assignments - Schedule staff according to hours required according to employee status and service coverage required
Analyze cause of operational problems using all available resources, such as input from co-workers, schematics, environmental influence, maintenance history, etc.	8(12) Monitor operations for product and process quality- Regularly compare current equipment performance to optimal equipment operations Investigate and report abnormal equipment conditions in a timely manner
Identify and consult with other people that have the knowledge and expertise in the area in which the problem exists.	8(14) Assist to investigate root causes of product and/or process failure - Participate on team investigation, Gather data as it pertains to the problem, magnitude, location, timing. Review all relevant data and quality monitoring tools, Develop a detailed description of the problem or process failure Develop a timeline or sequence of events to identify potential contributory relationships. Explore solution options
Verify operation after repair and document the repairs.	5(7) Production – Manufacturing – Monitor product and process specifications -Document quality control checks
Communicate with inside and outside technical support groups.	5(15) Document equipment use and/or operational problems - List the parties that need to be involved of repair and maintenance issues Describe the importance of documenting communications 8(15) Continually monitor corrective action to validate effectiveness
Inform machine operator and/or supervisor within standard operating procedures that machine is ready for operation.	5(15) Document equipment use and/or operational problems - Verify all internal and external communication with appropriate parties in a timely manner, Communicate maintenance and repair needs clearly, Use the correct reporting formats for communication, Document use, maintenance, and repair activities accurately

10. Inspect, Handle, and Install Bearings

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Select a bearing and prepare it for assembly on a piece of equipment. Handle in a manner that it won't be damaged. Identify bearing types and applications. Can match numbering and nomenclature to the bearing type. Store bearings where they will not be contaminated.	10(3) Industrial Equipment –Advanced - Mount a bearing - Follow preventive maintenance and repair of equipment steps, verify correct bearing for application,
Remove bearing and conduct bearing inspection. Identify proper or improper lubrication. Verify correct mounting clearances.	10(3) Mount a bearing – assist worksite professional to remove used bearings carefully and correctly
Collect applicable data and analyze bearing failures. Can identify probable cause and narrows it to specific cause upon examining a failed bearing. Determine if replacement is necessary.	10(3) Mount a bearing – assist worksite professional to analyze reason bearing failed
Identify load types on a shaft, RPM, heat, pre-load, type of	

bearing (sealed, shielded, open, etc.), lubrication requirements, lubrication differences, etc.	
Equipment rebuilds--Remove bearing and make sure no damage has occurred to the shaft and related equipment or to the bearing itself. Use tools that are sized correctly and applicable for the job.	
Measure and fit bearings to crankshaft.	
Install bearings. Prepare all appropriate surfaces for installation (shaft, bore, etc.) as required. Prepare bearing for installation (measure, hone, scrape, and lubricate grooves), referencing manufacturers' specifications for correct procedures.	10(3) Mount a bearing – assist worksite professional to prepare all appropriate surfaces (the shaft and bore) as required, assist worksite professional to mount bearing according to specifications
Upon installation, verify proper operation.	
Lubricate a bearing during routine inspection. Can identify bearings that do not require lubricant. Clean out old lubricant according to manufacturers' specifications and replace with the appropriate amount of grease/lubricant.	10(3) Mount a bearing – inspect bearing for condition and lubrication 9(10) Perform lubrication procedures – identify bearings that do not require lubricant

11. Inspect and Troubleshoot Belts, Chains, Sheaves, Pulleys, Sprockets, and Mechanical Drive Systems

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Identify different types of belts and their related components by size, construction, and use.	1(3) Required Skills- apply manufacturing industry knowledge – Explain the function of pulleys, gears, and belts,
Identify correct size and type of sheaves for the related drive components.	
Inspect belt drive systems. Recognize potential problems during inspection. Identify and explain when a component is worn out, failed, or failing and identify a misalignment problem.	10(6) Industrial Equipment – Advanced - Describe proper functioning of belts and chains and their reliability issues including belt drive, chain drive and roller chain drive functions 10(8) Maintain and repair mechanical drive system components – check pulley and belts for tension, wear, and damage, locate major components of mechanical drive system including v-belts, pulleys and chain drives, recognize reliability issues for belt and chain drives, determine proper belt deflection force required for tension
Troubleshoot belt drive systems. Can list possible causes for a problem and systematically reduce the list to a final cause or causes. Identify the failed or failing component and formulate an action plan for correction of the problem.	
Remove belt drive components. Select appropriate removal method. Inspect surroundings and related components during removal procedures.	
Select a belt for a belt drive system. Match belt by size and type. Identify possible cause of belt failure, if failure occurred. Analyze reason	10(8) Industrial Equipment –Advanced - Maintain and repair mechanical drive system components Maintain, install, align, and adjust tension on a belt drive

for failure when examining failed belt. Demonstrate use of belt and sheave gauges according to standard practice.	
Install a belt in a belt drive system. Correct a misalignment. Select the correct belt and related components for installation. Follow installation procedures according to standard practice or according to applicable technical manuals. Install all sheaves and related components according to specification. Install and inspect guards according to specification. Check for proper operation and make adjustments as needed.	10(8) Industrial Equipment –Advanced - Maintain and repair mechanical drive system components Maintain, install, align, and adjust tension on a belt drive

12. Inspect and Troubleshoot Conveyors and Related Components

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Inspect conveyor drive systems. Recognize potential problems, identify and explain component failure or potential failure, and identify misalignment problems.	
Troubleshoot conveyor drive systems. List possible causes for the problem, then systematically reduce the list to a final cause or causes. Identify and explain when a component has failed or is failing and formulate an action plan for correction.	
Remove conveyor drive components. Select an appropriate removal method and inspect surrounding and related components.	
Troubleshoot belt drive systems. Can list possible causes for a problem and systematically reduce the list to a final cause or causes. Identify the failed or failing component and formulate an action plan for correction of the problem.	10(8) Maintain and repair mechanical drive system components – check pulley and belts for tension, wear, and damage, locate major components of mechanical drive system including v-belts, pulleys and chain drives, recognize reliability issues for belt and chain drives, determine proper belt deflection force required for tension, Document mechanical drive system maintenance
Install a part in a conveyor drive system. Select the correct conveyor part and related components for installation, follow installation procedures according to standard practice and applicable technical manuals, install according to specifications, and check for proper operation. Make adjustments as needed and correct any	

misalignment.	
---------------	--

13. Inspect, Repair, and Maintain Couplings and Coupling Alignment

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Inspect couplings for wear and alignment. Inspect components, i.e., inserts, spiders, grids, etc.; check for seal leakage; analyze vibration data; check for equipment movement; looseness, axial and radial alignment. Determine what components are bad based on your observations and document needed repairs on work order.	10(3) Industrial Equipment – Advanced – Mount a bearing - Describe proper function of bearings and couplings and their reliability issues including functioning of transmission equipment, and bearings, shafts, and couplings function
Replace a coupling. Remove components that need to be replaced. Prepare equipment base (check for soft foot); check bore and shaft size; check coupling components, i.e., keys, pins, etc.; check shaft runout; and inspect parts. Check and set coupling gap to the manufacturer's recommendation for that style of coupling to ensure coupling gap is correct for the application. Align coupling.	10(8) Maintain and repair mechanical drive system components – install and align couplings
Demonstrate multiple alignment techniques to the manufacturer's recommended specification using methods such as laser, straight edge, straight and reverse dials indicator methods. Understand alignment terms for angular, axial and parallel.	
Demonstrate knowledge of various styles, applications, and nomenclature for couplings, such as grid, flexible, rigid, gear, chain, hub, insert spider, etc.	
Lubricate couplings. Insure coupling is not under or over-packed. Clean up any spilled lubricant and clean out grease fitting (if applicable) before adding grease. Add the specified lubricant and ensure that the proper amount has been added.	10(8) Maintain and repair mechanical drive system components – apply lubrication to mechanical drive system according to specifications
Perform preventive maintenance checks, such as noise, vibration, and/or heat. Ensure that all guards are replaced and installed according to specification. Check for proper operation and make adjustments as necessary.	9(9) Perform preventive maintenance – assist worksite professional to follow PM schedule to calibrate and maintain equipment, tools and workstations
Troubleshoot couplings. Conduct an analysis to determine cause and make repairs in	

accordance with manufacturer's recommendations.	
---	--

14. Identify, Maintain, and Install Pumps

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Identify and understand terms that relate to pump case sealing, such as stuffing box, packing, packing gland, sealing water, lantern ring, suction inlet and discharge, mechanical seals, and pump sleeve.	
Demonstrate knowledge of operation and nomenclature for centrifugal pumps, such as vanes, impellers, volute, suction inlet, discharge nozzles, lantern ring, wear ring, clearance, direction, and centrifugal force.	
Identify and understand operation and terminology for various styles of reciprocating pumps, such as plunger, diaphragm, single acting, double acting, stoke, air chamber, and check valve.	
Identify and understand operations and terminology for various styles of rotary pumps, such as internal gear, screw, rotor, shuttle block, crescent seal, blade type vanes, helical, and liquid ring vacuum.	
Identify and understand operations for various styles of linear style pumps, such as rope and chain.	
Demonstrate an understanding of pump capacity, lift, pressure, head, specific gravity, and translate plotted performance pump curves.	
Demonstrate knowledge of pump rebuilds and perform maintenance, such as alignment, packing replacement and take up, sleeve inspections/replacement, bearing inspections/replacement, and lubrication.	
Troubleshoot pump operating problems, such as discharge failure, cavitation, vibration, high power usage, too much or not enough capacity, and interruption of discharge.	

15. Inspect and Troubleshoot Exhaust Fans and Blowers

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Identify different types of exhaust fans and blowers for a	

specific application.	
Inspect, troubleshoot, and maintain different types of exhaust fans and blowers. Correctly diagnose a problem, identify a defective component, and properly maintain using appropriate realignment and balancing techniques.	
Replace an exhaust fan and/or blower. Select a replacement fan, blower, or component and ensure proper operation when complete.	

16. Troubleshoot and Repair Gears, Gearboxes, and Gear Assemblies

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
<p>Examine different gear types and their applications. Identify gear types correctly, gear material, and correct application for each gear type. Correctly define gear-related terms, i.e., backlash, pitch, etc. Be capable of determining the gear ratio.</p>	<p>1(3) Required Skills – Apply manufacturing industry knowledge - Explain the function of pulleys, gears, and belts 10(8) Maintain and repair mechanical drive system components – clean, install and align gear drives</p>
<p>Inspect gear assemblies. Identify potential problems encountered during inspection, list possible causes and solutions for identified problems, and use appropriate tools during the inspection.</p>	
<p>Troubleshoot gear and related problems. Identify various types of gears and their related failures; assess available data for patterns, inconsistencies, etc.; and be capable of explaining how their senses are used in the troubleshooting process.</p>	
<p>Remove gears and related drive components. Select the appropriate removal method for a specific application. Select the appropriate tools for a specific application. Explain proper care of components to prevent damage and contamination during and after disassembly. Inspect and explain the importance of all related components for wear and damage during the removal process.</p>	
<p>Reassemble gear assemblies. Identify all correct tolerances per manufacturer or other technical specification. Select the correct gears and related components for the application. Explain the importance of cleanliness in the reassembly process. Inspect and ensure all gears are in place and installed according to specification. Check for proper operation and adjust as needed.</p>	
<p>Troubleshoot gear and related problems. Identify various types of gears and their related failures; assess available data for patterns, inconsistencies, etc.; and be capable of explaining how their senses are used in the troubleshooting process.</p>	

17. Identify, Inspect and Sample Lubricants and Coolants

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Inspect different types of lubricants and coolants for contamination. Demonstrate the ability to identify contaminants in the fluid and take appropriate action. If necessary, locate a technical source to assist in identifying the contaminant.	9(10) Industrial Equipment –Basic - Perform lubrication procedures – draw lubricant samples for analysis, test lubricant for contamination and viscosity, use procedures to avoid contamination
Draw samples of lubricants and/or coolants for analysis. Use procedures to avoid fluid contamination and label and route sample following employer guidelines.	9(10) Perform lubrication procedures – draw lubricant samples for analysis, test lubricant for contamination and viscosity
Lubricate equipment. Determine the appropriate lubricant type, properly apply the lubrication and quantity necessary, and properly assess if the lubricant is getting to where it is required.	9(10) Perform lubrication procedures – describe the different types of lubricants, their uses, storage and disposal requirements; fill reservoir with correct lubricant, use procedures to avoid contamination

18. Inspect, Maintain, and Operate Rigging and Hoisting

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Determine appropriate rigging or hoisting equipment for the application. Inspect for rigging application, defective rigging equipment, and load limits. Calculate the weight of a load and determine if load is within the range of a specific lifting apparatus, then match the apparatus for the load being moved.	
Rig a load. Assess the rig and load for safety before lifting, identify potential lift hazards, ensure rigging is properly attached to the load, and ensure the load is protected from potential hazards.	
Move a load with an overhead crane. Complete the pre-operational hoist inspection and operations check; inspect rigging gear; load in accordance with Riggers' Handbook; verify sling, hook, and crane capacity; plan route for object being hoisted, and operate the controls smoothly and correctly.	
Move a load with a mobile crane. Complete the pre-operational mobile crane inspection and operations check; inspect rigging gear; verify capacity; and maintain clearance from objects, equipment, and people, paying	

<p>particular attention to overhead obstructions and/or power lines. Upon completion, complete the post-operational check.</p>	
--	--

19. Set, Assemble, and Secure Machinery or Equipment

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
<p>Set and level equipment. Ensure base plate and auxiliary equipment are correct for the application, ensure equipment is properly rough-aligned and leveled, set up and use a transit according to standard procedure and/or applicable manual.</p>	<p>10(2) Industrial Equipment –Advanced - Maintain and repair hydraulic and/or pneumatic system components - Set up and fabricate metal – layout and plan work, place parts and assemblies into fixtures, position, align, and bolt jigs, holding fixtures, guides, and stops onto machines, position, align and/or clamp work pieces into jigs and/or holding fixtures, prepare base metal, add or adjust safety guards, verify machine or equipment settings, verify blades, shears, etc appropriate for metal fabrication to be completed</p>
<p>Optically align equipment. Align the base plate/auxiliary equipment within the manufacturer’s specifications, ensure any associated equipment has no loose or unbolted parts, and align using a transit.</p>	
<p>Laser align equipment—Set up a laser according to manufacturer’s recommendations, visually align equipment, mount the applicable alignment tools, apply laser targets to the piece, and utilize the menu on the control box of the laser alignment tool to take required measurements. Enter data into the laser alignment tool. Document baseline reading.</p>	

20. Start Up of Equipment

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
<p>Start up new or existing equipment that has been idle for an extended period of time. Ensure all power sources are applied. Review and follow any applicable manufacturer check lists and complete all required functional checks.</p>	<p>5(8) Production - Manufacturing Processes – Perform start up - Verify correct set up of equipment adjustments Inspect piece/product Document start up procedure</p>
<p>Troubleshoot equipment. Check alignment, record all relevant data, and compare current operational characteristics to a known baseline.</p>	<p>3(3) Manufacturing Fundamentals - Operate tools and equipment safely Discuss start up and shut down procedures for each tool/equipment you will operate</p>
<p>Identify any issues. Utilize proper repair methods and complete repairs in accordance with the applicable technical references. Evaluate post repair conditions to ensure that the problem has been resolved.</p>	<p>5(8) Manufacturing Processes - Perform start up - Describe the production process procedure to be completed List the situations which require you to obtain help to resolve problems with equipment or production</p>

21. Inspect and Maintain Compressors

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
<p>Inspect compressor. Refer to technical manuals for specific parameters, ensure that compressor rotates freely, ensure critical dimensions are within limits according to technical manuals or specifications, complete the required documentation, and clean up the job site after the work is complete.</p>	
<p>Troubleshoot compressor. Communicate with other departments and employees affected by the troubleshooting process, verify the type of compressor being used, collect and analyze component history, and use manufacturer’s troubleshooting procedure where available.</p>	

22. Maintain Hydraulic/Pneumatic Systems

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
<p>Maintain a cylinder. Ensure cylinder is straight and slides smoothly, ensure seals do not leak, ensure it is correct for a given application, ensure that the piston is secure to the rod, ensure the piston rod threads are not flawed, ensure it does not leak air or fluid, ensure valves operate within manufacturer's specifications, and ensure actuator strokes from fully retracted to fully extended.</p>	<p>10(10) Industrial Equipment –Advanced Maintain and repair hydraulic and pneumatic system components – check operation of control valves and cylinders and replace if required</p>
<p>Maintain an actuator. Check for smooth operation, ensure indicators are in place and easy to read, adjust packing according to specifications, lubricate to the correct level using the proper lubricant, ensure diaphragm does not leak, and complete the correct documentation as required by the job.</p>	<p>4(14) Monitor equipment for correct operation - Describe common pneumatic system reliability issues including pressure gage readings, conductors, connectors, seals, gaskets, packing, quick-connect fittings, pneumatic cylinder and motor operations, air muffler operations, actuator power output, and pressure regulator operations</p>
<p>Maintain an accumulator. Communicate with others who will be affected by the accumulator service, reference manufacturer's procedures for removal, disassembly, and reassembly.</p>	
<p>Troubleshoot an accumulator. Ascertain the correct repair, ensure it holds and does not exceed its rated pressure, check for leakage of gas or fluid, ensure the accumulator passes all test parameters, and document all repairs.</p>	
<p>Select and change hydraulic fluid. Select the correct fluid that meets manufacturer's specifications, identify contaminated fluid, and use procedures to avoid contamination when changing fluid.</p>	<p>10(10) Industrial Equipment – Advanced - HYDRALICS - Draw sample of hydraulic fluid for analysis, Test hydraulic fluids for contamination and viscosity, Drain hydraulic fluids if required, Fill reservoir with correct hydraulic fluid, Use procedures to avoid fluid contamination</p>
<p>Understand electrical control field devices related to functional input or output expectations with positioning or operation of hydraulic or pneumatic systems.</p>	
<p>Install hydraulic/pneumatic fittings. Comply with or follow pipe print, choose fittings that conform to the print or drawing, ensure fittings are aligned to eliminate system stress, flush and purge fittings as needed during assembly, and pressurize the system and check for leaks at the fittings.</p>	<p>10(10) Industrial Equipment – Advanced - Describe the use of different types of pneumatic conductors and connectors for a given system</p>
<p>Maintain hydraulic/pneumatic systems. Locate prints or drawings as needed, isolate</p>	<p>10(10) Industrial Equipment – Advanced - Assist worksite professional to identify and diagnose</p>

problem causes, check for corrosion, use proper sealant for the type of system, select correct replacement parts and fittings, and ensure hydraulic/pneumatic system pressures and flows are consistent with original specifications.	equipment problem, Interpret schematics for hydraulic and/or pneumatic systems
---	--

23. Install Tubing, Hoses, and Related Components

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Install tubing with fittings. Ensure tubing/hose is rated for the system requirements, cut to correct length and debur, make flare to correct angle as required, and ensure flare is not cracked and does not stress metal.	10(10) Assist worksite profession to identify and diagnose equipment problem-o Inspect and replaces hoses, tubing and fittings if required
Install various types of poly tubing with their corresponding method of connections. Understand the selection process, taking into account heat, pressure, chemicals, environment, and proper specifications, depending on the application.	

24. Install and Maintain Valves

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Maintain a valve. Troubleshoot problem and recommend a plan for corrective action. Perform maintenance and repairs according to the manufacturer's manual or plant procedure. Determine whether to repair or replace valve parts.	10(10) Industrial Equipment –Advanced - Maintain and repair hydraulic and pneumatic system components – check operation of control valves and cylinders and replace if required
Assemble a valve. Assemble according to manufacturer's manual, verify valve operates smoothly without leaking, and document work performed.	
Demonstrate the ability to identify various types of valves and their applications, such as ball, globe, gate butterfly, etc.	

25. Predictive Maintenance

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Understand the different types of test instruments and materials used for predictive	9(9) Industrial Equipment – Basic -Perform preventive maintenance (PM) - Compare preventive

<p>maintenance, such as thermal cameras, analyzers, recorders, dyes, and ultrasonic listening devices.</p>	<p>maintenance to predictive maintenance, Identify when to use preventive action and when to use corrective action</p>
<p>Take a vibration measurement - measure vibration by using test instruments. Calibrate and insure testing instrument being used is in spec., then document readings taken.</p>	
<p>Evaluate vibration readings/ analysis. Locate and evaluate equipment history. Compare the new test readings with the equipment history and established base level. Determine the cause of the vibration and determine if and what corrective measures need to be done.</p>	
<p>Demonstrate an understanding and use of various Ultra-Sonic Detection instruments. Calibrate and insure testing instrument being used is in spec. before taking readings.</p>	
<p>Take Ultra-Sonic measurements – Using test instruments measure for various things such as material thickness or material cracks, flow and leaks in systems for steam, air, gas and fluids.</p>	
<p>Evaluate Ultra-Sonic reading/analysis. Locate and evaluate equipment history. Compare the new test readings with the equipment history and established base level. Determine if there is a deficiency and determine what corrective measures are needed to be done to correct.</p>	
<p>Demonstrate an understanding and use of various Thermal Imaging instruments. Calibrate and insure testing instrument being used is in spec before taking readings.</p>	
<p>Take and evaluate Thermal Imaging readings. Use test instruments to measure heat. Evaluate and compare readings with established baselines and determine what corrective measures are needed to be done to correct deficiencies using best practices.</p>	
<p>Demonstrate an understanding of dye penetrant testing and how it may be used to test for cracks.</p>	
<p>Demonstrate an understanding of Oil Analysis and how it may be used to test for lubrication breakdowns.</p>	

26. Preventative Maintenance

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Demonstrate preventative maintenance techniques by performing PM's in accordance with manufacturer's specifications and company procedures.	<p>9(9) Industrial Equipment – Basic Perform preventative maintenance (PM)–</p> <p>Performance standard criteria: complete scheduled PM tasks in a timely manner, communicate PM to production, assure that alternative equipment is available if needed by production, consult worksite professionals, technical draws, maintenance manuals, and equipment history for PM, Determine type of lubrication requirements, Gather equipment and supplies needed to perform PM, Ensure that equipment is properly labeled and pulled from production use, Follow appropriate Lock Out / Tag Out procedures prior to performing PM, Follow all safety requirements and wear appropriate PPE as required, assist worksite professional to follow PM schedule to calibrate and maintain equipment, assist worksite professional to re-qualify equipment for operation, document preventative actions completed Evaluate PM through follow up</p>
Assist with establishing PM procedures by gathering information from resources such as the OEM recommendations, code requirements, machine history, employees familiar with the machine and other maintenance that's already done to similar equipment.	
Assist with the scheduling for PM activities. Help determine PM frequencies (how often) based on the manufacturer recommendations and history of equipment performance. Communicate this information with operations and personnel affected in that department.	
Perform equipment rounds. Verify equipment is operating within correct tolerances by checking values of measurement at established points on the machine.	
Inspect system components, whether electrical or instruments, following the procedure previously established. Insure that it is within the calibration period and within the scheduling period. Verify operation within established parameters.	
Perform necessary tasks as outlined in established PM procedure, such as: Lubricate system components Adjust, identify and/or replace faulty components Verify system operation.	
Complete PM documentation.	
Perform corrective maintenance tasks identified from predicative measures that specify fault frequencies, alignment, balancing, looseness, or bearing faults. If necessary, locate a technical source to assist in understanding the results formulated from the predictive test procedure done and what corrective action is required.	

27. Possess Knowledge of Basic Computer Skills

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Computerized Maintenance Management System (CMMS)—Can access, view histories and reports, document and understand the flow of information in the company’s software. Demonstrate usage of software with proper techniques as outlined by the company’s procedures/policies.	1(10) Required Skills – use basic technology - Enter, edit, and store data on computerized equipment according to worksite guidelines Verify data entry prior to data storage or equipment operation
Inventory System—Can access history on part and find replacement parts necessary to complete the repair.	8(3) Production Operations Management – Manage inventory levels- Assist worksite professional to monitor master production schedule and inventory master file for ordering levels
Demonstrate working knowledge of office software. Properly use the company email or electronic form of communication provided.	1(10) Required Skills – use basic technology - follow rules for proper computer and communication technology usage, Use communication technology (such as pagers, radios, phone, fax, email, Internet) to access and distribute data and other information within the scope of the job, Explain appropriate and inappropriate uses of email and internet while at work

28. Utilize Tool and Parts Crib

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Tool crib—Handle tools and equipment in a manner that keeps them safe and undamaged. Keep tools and equipment stowed properly until needed.	9(8) Industrial Equipment – Basic – Use hand tools - Review safety procedures Select the appropriate hand tool for the job...

29. Operate Mobile and Power Lift Equipment

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Operate a forklift. Complete pre-operational check, engage and pick up load according to procedure, manage speed for conditions and load, and complete post-operational check.	N/A – Forklifts prohibited to minors
Operate overhead and mobile cranes. Complete pre-operational hoist inspection; rigs load in accordance with the Rigger’s Handbook; verify sling, hook, and crane capacity; does not exceed recommended sling angle; plan route for object being hoisted; operate the controls smoothly and correctly; maintain clearance	N/A

from objects, equipment, and people; and complete the post-operational check.	
Operate a personal lift. Complete the pre-operational check, correctly operate lift on manual and on remote, manage speed for conditions and load, and complete post operational check.	

30. Shop Tool Operation

Maintenance Technician (RA Job Book)	YA Manufacturing (Skills Checklist)
Operate a pedestal grinder. Complete pre-operation check before grinding, use appropriate grinding wheel, perform a ring test on the grinding wheel before the new wheel is installed, and dress the grinding wheel if necessary. Set up the grinder properly, including tool rest and wheel clearances; and use the proper-sized flanges and wheel blotters. Select a wheel that is the correct size for the machine and its spindle diameter in addition for the application. Check wheel runout and wobble when spun by hand. Check wheel for excessive vibration.	6(6) Production Machining – Assist to perform set up – GRINDERS, Mount, dress, and balance selected grinding wheel for the operation, Identify the major components of grinders and their functions Identify variables for grinder speeds and feeds 7(5) Production – Welding – Explain use and safety restrictions for use of grinders to prepare base metal
Operate a surface grinder. Select the correct grinding wheel for the given application, perform ring test on the grinding wheel before the new wheel is installed, ensure the grinding wheel is dressed, and ensure the part to be ground is adequately secured.	6(9) Production – Machining- GRINDERS, Describe the motions between pieces and grinders, Describe the techniques required to grind a piece to specified tolerance
Operate a milling machine. Properly set up using correct speeds and feeds for a given application, ensure the part to be milled is adequately secured, use proper cutter for application, select proper coolant if applicable, and machine component to size specifications.	6(3) Production – Machining – Identify Set up - MACHINE/MILLING CENTERS, Describe automated machining process characteristics, major components, advantages and limitations of sawing, drilling, and milling machines, Identify chip cutting theory and machineability 6(5) Production – Machining – Perform Safety Checks - List the safety rules for grinders, lathes and milling machines
Operate a band saw. Select the proper blade for the application, properly set up the saw, ensure the item to be sawed is adequately secured, select the proper speeds and feeds for completing the cut, and saw the product to within the required specifications.	6(4) Production – Machining – select Tools and Materials - Identify major types of sawing machines,...and their applications, Describe advantages and limitations of sawing machines, drill presses and milling machines, List typical work holding devices for each machine type, List advantages and disadvantages for various work holding devices
Operate a drill press. Use proper speeds and feeds for the given application, ensure the item to be drilled is adequately secured, select the proper	3(3) Manufacturing Fundamentals – Operate tools and equipment safely - Identify major types of sawing machines, drill presses, and milling

speeds and feeds as applicable, and use proper drill for application.

machines and their applications, Describe advantages and limitations of sawing machines, drill presses and milling machines, List typical work holding devices for each machine type
List advantages and disadvantages for various work holding devices
6(3) Production - Machining – Identify setup - Describe automated machining process characteristics, major components, advantages and limitations of sawing, drilling, and milling machines, Identify chip cutting theory and machineability

Appendix A: Manufacturing Youth Apprenticeship Required Skills

This appendix provides an overview of the Required Skills of the Manufacturing Youth Apprenticeship Program. A more detailed description of each of these required skills can be found in the full Manufacturing Program Guide and Appendices, located at the Youth Apprenticeship website: <http://dwd.wisconsin.gov/youthapprenticeship/programs.htm#>

Manufacturing Youth Apprenticeship Table of Contents

REQUIRED SKILLS

Unit 1: Core Skills

1. Apply academic knowledge
2. Apply career knowledge
3. Apply manufacturing knowledge
4. Communicate effectively
5. Act professionally
6. Cooperate with others in a team setting
7. Think critically
8. Exhibit regulatory and ethical responsibilities
9. Use resources wisely
10. Use basic technology

Unit 2: Safety

1. Follow personal safety requirements
2. Maintain a safe work environment
3. Demonstrate professional role in an emergency

Unit 3: Manufacturing Fundamentals

1. Focus on customer needs
2. Measure using various instruments
3. Operate tools and equipment safely

4. Practice quality assurance principles

PATHWAY UNITS

Unit 4: Production Pathway: Assembly & Packaging

1. Read technical drawings & work orders
2. Interpret assembly & packaging symbols & procedures
3. Identify set up for assembly
4. Select tools and materials
5. Perform safety checks
6. Perform assembly set up
7. Verify assembly set up
8. Perform assembly
9. Perform quality checks
10. Build packaging
11. Package product
12. Process packaging documents
13. Clean up
14. Monitor equipment for correct operation
15. Document equipment use &/or operational problems

Unit 5: Production Pathway: Manufacturing Processes

1. Read technical drawings & work orders
2. Interpret symbols & procedures
3. Identify set up
4. Select tools & materials
5. Perform safety checks
6. Assist to perform set up
7. Verify set up
8. Perform start up

9. Operate equipment
10. Monitor product & process specifications
11. Process production documents
12. Shutdown process
13. Clean up
14. Monitor equipment for correct operation
15. Document equipment use &/or operational problems

Unit 6: Production Pathway: Machining

1. Read machining technical drawings & work orders
2. Interpret machining symbols & procedures
3. Identify set up
4. Select tools and materials
5. Perform safety checks
6. Assist to perform set up
7. Verify set up
8. Perform start up
9. Operate machining equipment
10. Monitor machining product and process specifications
11. Process production documents
12. Shutdown machining process
13. Clean up
14. Use hand tools
15. Use CNC equipment (W/S)
16. Monitor equipment for correct operation
17. Document equipment use &/or operational problems

Unit 7: Production Pathway: Welding

1. Read welding technical drawings & work orders
2. Interpret welding symbols & procedures
3. Layout & plan work
4. Perform safety checks
5. Prepare base metal
6. Set up to fabricate base metal
7. Fabricate base metal
8. Thermally/chemically cut metal
9. Tack work pieces
10. Weld metal
11. Monitor product & process
12. Assist to inspect, measure, &/or test completed metal pieces
13. Process production documents
14. Clean up
15. Monitor equipment for correct operation
16. Perform routine preventive maintenance (PM)
17. Document equipment use, PM, &/or operational problems

Unit 8: Production Operations Management Pathway: Production Operations Management Inventory

1. Assist to purchase materials & supplies
2. Receive inventory
3. Manage inventory levels
4. Distribute materials & products
5. Assist to develop inventory forecasts (W/S)
6. Maintain inventory records

Resources

7. Assist to develop a production plan for customer order (W/S)

8. Assist to record & summarize financial data
9. Assist to coordinate work schedules & duty assignments

Quality Management

10. Use quality tools
11. Calibrate tools & equipment (W/S)
12. Assist to analyze production process for productivity (W/S)
13. Monitor operations for product & process quality
14. Assist to investigate root causes of product &/or process failure
15. Take corrective action to restore or maintain quality
16. Participate in quality improvement processes

Units 9-10: Maintenance, Installation, & Repair Pathway: Industrial Equipment

Basic Industrial Equipment Unit

1. Read technical drawings & work orders
2. Interpret equipment symbols & procedures
3. Maintain schedules, communication, & documentation
4. Monitor equipment for correct operation
5. Identify maintenance requirements
6. Layout & plan work
7. Perform safety checks
8. Use hand tools
9. Perform preventive maintenance (PM)
10. Perform lubrication procedures
11. Assist with basic equipment problem identification & diagnosis
12. Assist with basic equipment repair
13. Assist to re-qualify equipment

Advanced Industrial Equipment Unit

1. Calibrate tools and instruments (W/S)

2. Set up & fabricate metal
3. Mount a bearing
4. Install mechanical fasteners
5. Assist with electrical circuit problem identification & diagnosis
6. Assist with motor control problem identification & diagnosis
7. Assist with hydraulic &/or pneumatic problem identification & diagnosis
8. Maintain and repair mechanical drive system components
9. Maintain and repair electrical control system components
10. Maintain and repair hydraulic &/or pneumatic system components
11. Assist to install & qualify equipment