# **Work Process Schedule**

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| Industrial Maintenance Mechanic | |
| **Job Description:** Maintain and repair manufacturing equipment. | |
| **RAPIDS Code:** 0308CB | **O\*NET Code:** 49-9041.00 |
| **Estimated Program Length:** 1 year | |
| **Apprenticeship Type:**  Competency-Based  Time-Based  Hybrid | |

Suggested On-the-Job Learning Outline

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| Operates in the workplace in a safe and effective manner | | |
| **Competencies** | **Date Completed** | **Initial** |
| 1. Adheres to safety, health, and environmental rules and regulations |  |  |
| 1. Performs machine operation, including start-up, emergency, and normal shutdown and manual functions to effectively and safely meet production and maintenance requirements (with operator present) |  |  |
| 1. Monitors machine operation and verifies that performance meets production requirements |  |  |
| 1. Locates, interprets, and stores machine operation and maintenance documentation |  |  |
| 1. Performs planned and unscheduled machine maintenance procedures in accordance with a company-approved maintenance plan |  |  |

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| Monitors, troubleshoots, installs, and repairs basic mechanical systems | | |
| **Competencies** | **Date Completed** | **Initial** |
| 1. Adheres to mechanical power transmission safety rules |  |  |
| 1. Uses dimensional measurement tools properly to inspect dimensions of shafts and other components |  |  |
| 1. Safely examines, troubleshoots and repairs power transmission |  |  |
| 1. Aligns and adjusts gear drives |  |  |
| 1. Installs, aligns and adjusts a pillow block bearing |  |  |
| 1. Lubricates equipment using correct lubricants and as recommended by manufacturer's guidance |  |  |
| 1. Performs a preventive maintenance procedure for a given machine to extend machine life and minimize downtime |  |  |
| 1. Performs predictive maintenance on a given machine to extend machine life and minimize downtime |  |  |
| 1. Reads and interprets technical drawings of parts and assemblies with tolerances and basic Geometric Dimensioning and Tolerancing (GD&T) |  |  |
| 1. Uses hand tools to inspect, adjust/tighten and assemble/disassemble equipment and support preventive maintenance, inspection and troubleshooting activities |  |  |
| 1. Uses hoists and other tools to safely handle and move parts and equipment |  |  |
| 1. Selects and uses troubleshooting methodologies to find malfunctions in machine systems to return the system to reliable, productive use in the shortest time possible |  |  |

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| Monitors, troubleshoots, installs, and repairs basic hydraulic systems | | |
| **Competencies** | **Date Completed** | **Initial** |
| 1. Adheres to fluid power systems safety rules while understanding safety, health, and environmental rules and regulations |  |  |
| 1. Interprets basic fluid power schematics and identifies schematic symbols, process flow and operation of the components and systems |  |  |
| 1. Starts up and shuts down a hydraulic system and adjusts system pressure using a fixed displacement pump |  |  |
| 1. Adjusts hydraulic actuator speed using a flow control valve |  |  |
| 1. Services a hydraulic filter to maximize hydraulic fluid cleanliness |  |  |
| 1. Adds, changes and properly disposes of waste hydraulic fluid |  |  |
| 1. Installs hydraulic conductors |  |  |
| 1. Installs and tests components in a basic hydraulic circuit |  |  |
| 1. Troubleshoots a basic hydraulic circuit or rotary actuator circuit |  |  |

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| Monitors, troubleshoots, installs, and repairs basic pneumatic systems | | |
| **Competencies** | **Date Completed** | **Initial** |
| 1. Adheres to fluid power systems safety rules |  |  |
| 1. Adjusts pneumatic system branch and actuator speed operating pressure using a regulator |  |  |
| 1. Services a pneumatic filter through inspection, drainage, and changes |  |  |
| 1. Services a pneumatic lubricator through inspection, fills, and adjustments |  |  |
| 1. Installs, fills, and adjusts pneumatic conductors |  |  |
| 1. Starts up and shuts down a reciprocating air compressor and adjusts operating pressure |  |  |
| 1. Installs and tests the operation of components in a basic pneumatic linear or rotary circuit given a schematic |  |  |
| 1. Installs and tests components in a pneumatic circuit that uses vacuum generators given a schematic |  |  |
| 1. Troubleshoots a basic pneumatic circuit |  |  |

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| Monitors, troubleshoots, and repairs electrical systems | | |
| **Competencies** | **Date Completed** | **Initial** |
| 1. Adheres to electrical power and control systems safety rules for electrical power and control systems |  |  |
| 1. Interprets electrical control and power schematics to ensure the operation of the components and system |  |  |
| 1. Adjusts limit switches and electronic sensors |  |  |
| 1. Measures voltage, current and resistance in an electrical circuit to verify system operation and power levels |  |  |
| 1. Selects, installs, and tests fuses and circuit breakers |  |  |
| 1. Installs and tests DC electric motors in a manual control circuit |  |  |
| 1. Installs and tests AC electric motors in a manual control circuit |  |  |
| 1. Installs and tests electrical relay control components and circuits |  |  |
| 1. Installs and tests electro-fluid power components and circuits |  |  |
| 1. Tests and repairs machine electrical ground |  |  |
| 1. Troubleshoots an electrical motor relay control circuit |  |  |
| 1. Troubleshoots a solenoid-operated fluid power relay control circuit |  |  |
| 1. Replaces electrical control wiring using terminal attachment |  |  |
| 1. Replaces electrical control wiring using solder attachment |  |  |
| 1. Installs, examines, repairs, and replaces transformers |  |  |

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| Monitors, troubleshoots, installs, and repairs electronic and process control systems | | |
| **Competencies** | **Date Completed** | **Initial** |
| 1. Adheres to safety, health, and environmental rules and regulations for electronic power and control systems |  |  |
| 1. Connects and tests a DC power supply to ensure proper operation |  |  |
| 1. Installs and tests solid-state AC and DC discrete and analog relays |  |  |
| 1. Installs and tests analog electronic sensors and signal conditioning equipment |  |  |
| 1. Adjusts and repairs AC drive to control motor speed and torque |  |  |
| 1. Transfers programs to programmable controller using a PC |  |  |
| 1. Creates a basic Programmable Logic Controller (PLC) ladder-style program using internal and external contacts, timers, counters, non-retentive output coils, internal coils, subroutines, conditional commands and math commands |  |  |
| 1. Installs and tests basic PLC components that uses a ladder logic program to interface to a hardware component |  |  |
| 1. Performs basic troubleshooting of PLC and controlled components |  |  |

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| Performs maintenance welding to manufacture or repair parts, equipment, and other materials | | |
| **Competencies** | **Date Completed** | **Initial** |
| 1. Adheres to safety, health, and environmental rules and regulations for welding |  |  |
| 1. Uses an acetylene torch properly while using appropriate safety equipment and precautions to cut steel parts |  |  |
| 1. Performs basic welding and achieves necessary strength, resilience, shape and size requirements |  |  |
| 1. Prepares parts to be welded including degreasing, cleaning, grinding and inspecting |  |  |
| 1. Uses Shielded Metal Arc Welding (SMAW) Welder to make basic welds on flat stock |  |  |
| 1. Uses Gas Metal Arc Welding (GMAW) Welder to make basic welds on flat stock |  |  |
| 1. Inspects welds for integrity and functionality |  |  |
| 1. Uses plasma cutter to cut flat stock |  |  |

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| Installs, removes, repairs, and replaces piping systems | | |
| **Competencies** | **Date Completed** | **Initial** |
| 1. Adheres to safety, health and environmental rules and regulations for piping systems |  |  |
| 1. Interprets basic piping schematics including specifications and fittings |  |  |
| 1. Identifies and selects correct piping materials |  |  |
| 1. Accurately measures, cuts and prepares piping for installation |  |  |
| 1. Installs and tests piping systems |  |  |

Suggested Related Instruction Outline

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| Provider | |
| **Name:** | |
| **Address:** | |
| **Email:** | **Phone Number:** |
| **Related Instruction Hours:** 144 | |

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| **Course Number** | **Course Title** | **Contact Hours** |
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