Industrial Maintenance Mechanic

L1  INDUSTRIAL MAINTENANCE MECHANIC

The modules listed below are included in the Trainee Guide. The following ISBNs are for ordering individual modules only.

Orientation to the Trade (2.5 Hours)
(Module ID 32101-07) Covers the history of the trade, and provides an overview of the industrial maintenance craft. Describes the responsibilities and characteristics of successful workers.

Tools of the Trade (5 Hours)
ISBN 978-0-13-614584-4
(Module ID 32102-07) Introduces hand and power tools used in industrial maintenance. Covers safety procedures and proper use of these tools.

Fasteners and Anchors (5 Hours)
(Module ID 32103-07) Covers the hardware and systems used in industrial maintenance. Describes anchors and supports, their applications, and how to install them safely.

Oxyfuel Cutting (17.5 Hours)
(Module ID 32104-07) Explains the safety requirements for oxyfuel cutting. Identifies oxyfuel cutting equipment and provides instructions for setting up, lighting, and using the equipment. Explains how to perform straight line cutting, piercing, beveling, washing, and gouging.

Gaskets and Packing (10 Hours)
(Module ID 32105-07) Introduces gaskets and gasket material, packing and packing material, and types of O-ring material. Explains the use of gaskets, packing, and O-rings, and how to fabricate a gasket.

Craft-Related Mathematics (15 Hours)
(Module ID 32106-07) Explains how to use ratios and proportions, solve basic algebra, area, volume, and circumference problems, and solve for right triangles using the Pythagorean theorem.

Constraction Drawings (12.5 Hours)
(Module ID 32107-07) Introduces plot plans, structural drawings, elevation drawings, as-built drawings, equipment arrangement drawings, P&IDs, isometric drawings, basic circuit diagrams, and detail sheets.

Introduction to Ferrous Metal Piping Practices (5 Hours)
(Module ID 32203-07) Covers the selection, preparation, joining, and support of copper and plastic piping and fittings.

Introduction to Ferrous Metal Piping Practices (5 Hours)
ISBN 978-0-13-614624-0
(Module ID 32204-07) Covers iron and steel pipe and fittings and provides step-by-step instructions for cutting, threading, and joining ferrous piping.

Pumps and Drivers (5 Hours)
(Module ID 32108-07) Explains centrifugal, rotary, reciprocating, metering, and vacuum pump operation and installation methods, as well as types of drivers. Describes not positive suction head and cavitation.

Valves (5 Hours)
(Module ID 32109-07) Identifies different types of valves and describes their installation as well as valve storage and handling.

Introduction to Test Instruments (7.5 Hours)
(Module ID 32110-07) Introduces test equipment for industrial maintenance, including tachometers, pyrometers, strobos, meggers, and automated diagnostic tools.

Material Handling and Hand Rigging (15 Hours)
(Module ID 32111-07) Introduces the equipment and techniques of material handling, and describes the procedures for rigging and communicating with riggers.

Mobile and Support Equipment (10 Hours)
(Module ID 32112-07) Explains safety procedures and methods of operation for motorized support equipment, including forklifts, personal lifts, compressors, and generators.

Lubrication (12.5 Hours)
ISBN 978-0-13-614564-4
(Module ID 32113-07) Explains lubrication safety, storage, and classifications. Also explains selecting lubricants, additives, lubrication equipment, and lubricating charts.

Hydrostatic and Pneumatic Testing (10 Hours)
ISBN 978-0-13-614625-4
(Module ID 32206-07) Describes non-destructive and pressure testing of systems and equipment.

Introduction to Bearings (15 Hours)
(Module ID 32207-07) Introduces plain, ball, roller, thrust, guide, flanged, pillow block, and takeup bearings. Discusses bearing materials and designations.

Low-Pressure Steam Systems (10 Hours)
(Module ID 32208-07) Introduces the components and functions of basic steam systems, including boilers, steam traps, and blowdown recovery systems.

High-Pressure Steam Systems and Auxiliaries (20 Hours)
(Module ID 32209-07) Explains the functioning of high-pressure steam systems used in industry.

L2  INDUSTRIAL MAINTENANCE MECHANIC

The modules listed below are included in the Trainee Guide. The following ISBNs are for ordering individual modules only.

Basic Layout (20 Hours)
(Module ID 32201-07) Discusses the tools used in layout. Explains how to lay out baselines using the arc method and 3-4-5 method.

Introduction to Piping Components (5 Hours)
(Module ID 32202-07) Introduces chemical, compressed air, fuel oil, steam, and water systems. Explains how to identify piping systems according to color codes.

Copper and Plastic Piping Practices (5 Hours)
(Module ID 32203-07) Covers the selection, preparation, joining, and support of copper and plastic piping and fittings.

Introduction to Ferrous Metal Piping Practices (5 Hours)
ISBN 978-0-13-604624-0
(Module ID 32204-07) Covers iron and steel pipe and fittings and provides step-by-step instructions for cutting, threading, and joining ferrous piping.

Pumps and Drivers (5 Hours)
(Module ID 32108-07) Explains centrifugal, rotary, reciprocating, metering, and vacuum pump operation and installation methods, as well as types of drivers. Describes not positive suction head and cavitation.

Valves (5 Hours)
(Module ID 32109-07) Identifies different types of valves and describes their installation as well as valve storage and handling.

Introduction to Test Instruments (7.5 Hours)
(Module ID 32110-07) Introduces test equipment for industrial maintenance, including tachometers, pyrometers, strobos, meggers, and automated diagnostic tools.

Material Handling and Hand Rigging (15 Hours)
(Module ID 32111-07) Introduces the equipment and techniques of material handling, and describes the procedures for rigging and communicating with riggers.

Mobile and Support Equipment (10 Hours)
(Module ID 32112-07) Explains safety procedures and methods of operation for motorized support equipment, including forklifts, personal lifts, compressors, and generators.

Lubrication (12.5 Hours)
ISBN 978-0-13-614564-4
(Module ID 32113-07) Explains lubrication safety, storage, and classifications. Also explains selecting lubricants, additives, lubrication equipment, and lubricating charts.

Hydrostatic and Pneumatic Testing (10 Hours)
ISBN 978-0-13-614625-4
(Module ID 32206-07) Describes non-destructive and pressure testing of systems and equipment.

Introduction to Bearings (15 Hours)
(Module ID 32207-07) Introduces plain, ball, roller, thrust, guide, flanged, pillow block, and takeup bearings. Discusses bearing materials and designations.

Low-Pressure Steam Systems (10 Hours)
(Module ID 32208-07) Introduces the components and functions of basic steam systems, including boilers, steam traps, and blowdown recovery systems.

High-Pressure Steam Systems and Auxiliaries (20 Hours)
(Module ID 32209-07) Explains the functioning of high-pressure steam systems used in industry.

Continued on following page
Industrial Maintenance Mechanic Level 2 (continued)

Distillation Towers and Vessels (20 Hours)  
(Module ID 32310-07) Introduces the various types and functioning of distillation towers and vessels, including recovery vessels and condensate processing.

Heaters, Furnaces, Heat Exchangers, Cooling Towers, and Fin Fans (30 Hours)  
(Module ID 32311-07) Introduces equipment used to transfer and remove heat from systems in process.

Introduction to Tube Work (10 Hours)  
(Module ID 32312-07) Covers the basics of working with heat exchanger and furnace tubing and tube sheets.

Precision Measuring Tools (20 Hours)  
(Module ID 33002-08) Explains how to select, inspect, use and care for levels, feeler gauges, calipers, micrometers, height gauges and surface plates, dial indicators, protractors, parallels and gauge blocks, trammels, and pyrometers.

Installing Bearings (20 Hours)  
(Module ID 32303-08) Explains how to remove, troubleshoot, and install tapered, thrust, spherical roller, pillow block, and angular contact ball bearings.

Installing Couplings (15 Hours)  
(Module ID 32304-08) Identifies various types of couplings, and covers installation procedures using the press-fit method and the interference-fit method. Also covers coupling removal procedures.

Setting Baseplates and Prealignment (30 Hours)  
(Module ID 32305-08) Explains how to lay out and install baseplates and soleplates. Describes how to field-verify a plate installation. Covers precision leveling procedures and performing clearance installation. Also describes basic steps for setting motors and pumps.

Compressors and Pneumatic Systems (35 Hours)  
(Module ID 32403-09) Describes the theory and practice of compressing and transporting gases. Explains the types and principles of compressors and compressed air treatment equipment, as well as compressed air use and safety.

Reverse Alignment (30 Hours)  
(Module ID 32404-09) Describes preparation for dial indicator reverse alignment, and explains the procedures for setting up reverse alignment jigs. Explains graphic and mathematical techniques for aligning equipment based on a reverse dial indicator measurements.

Conventional Alignment (30 Hours)  
(Module ID 32306-08) Covers types of misalignment, aligning couplings using a straightedge and feeler gauge, adjusting parallel and angular alignment, using a dial indicator, and eliminating coupling stress.

Installing Belt and Chain Drives (10 Hours)  
(Module ID 32307-08) Covers the sizes, uses, and installation procedures of six types of drive belts and two types of chain drives.

Installing Mechanical Seals (20 Hours)  
(Module ID 32308-08) Covers the function and advantages of mechanical seals, identifies parts and types of seals, and includes procedures for removing, inspecting and installing mechanical seals.

Troubleshooting and Repairing Conveyors (20 Hours)  
(Module ID 32502-09) Describes maintaining and repairing belt, roller, chain, screw, and pneumatic conveyors.

Conventional Alignment (30 Hours)  
(Module ID 32306-08) Covers types of misalignment, aligning couplings using a straightedge and feeler gauge, adjusting parallel and angular alignment, using a dial indicator, and eliminating coupling stress.

Installing Belt and Chain Drives (10 Hours)  
(Module ID 32307-08) Covers the sizes, uses, and installation procedures of six types of drive belts and two types of chain drives.

Installing Mechanical Seals (20 Hours)  
(Module ID 32308-08) Covers the function and advantages of mechanical seals, identifies parts and types of seals, and includes procedures for removing, inspecting and installing mechanical seals.

Troubleshooting and Repairing Gearboxes (20 Hours)  
(Module ID 32406-09) Describes types and operation of gearboxes, and gearbox diagnostics. Explains how to troubleshoot, remove, and disassemble gearboxes, how to identify gear wear patterns, and how to install and maintain gearboxes.