



MICHIGAN MANUFACTURING TECHNOLOGY CENTER

PROFESSIONAL DEVELOPMENT

LEARNING PLANS FOR MANUFACTURING JOB ROLES

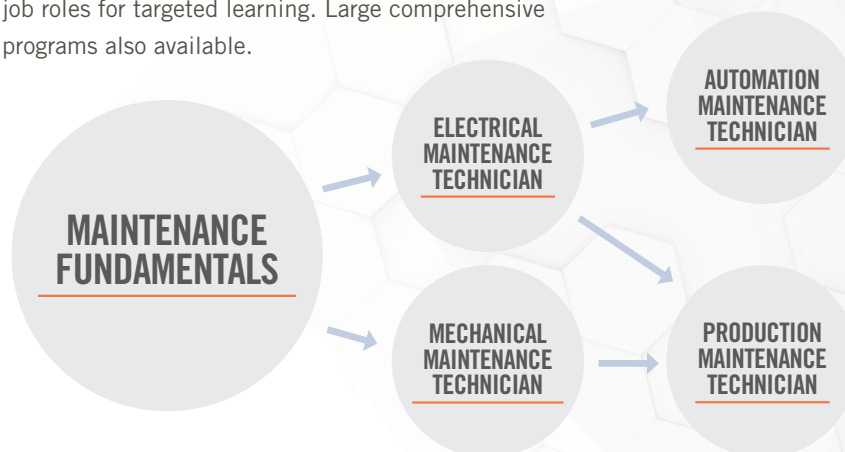
Online Training from Tooling U-SME offers a quick-start, progressive road map that allows manufacturers to build career paths for employees. This online training is intended to enhance your existing on the job training, to create a job progression plan and requires minimal preparation. It is efficient, effective training that has been developed with input from manufacturing experts.

FLEXIBLE AND CONVENIENT

Online classes are self-paced, typically taking 60 minutes to complete. They are easily and conveniently accessible on desktops and laptops, and on tablets and phones with the Tooling U-SME app.

CAREER PATHWAYS FOR MAINTENANCE JOB ROLES

Combine job roles for learning pathways, or offer single job roles for targeted learning. Large comprehensive programs also available.



Online Training offers:

- Content developed by industry experts
- Accessible anytime, anywhere
- Self-paced
- Predefined curriculum for each job role
- Engaging and interactive content
- Pre- and post-training knowledge assessments
- Access to Tooling U-SME's Learning Management System (LMS)
- Guidance from our Client Success team, including advice, insights, and ideas built on best practices and years of experience

Choose a starting point based on employee's experience or company goals for a quick-start training solution.

MAINTENANCE

MAINTENANCE FUNDAMENTALS

Maintenance Fundamentals provides an introduction to common manufacturing maintenance competencies, including Safety, Mathematics used in manufacturing, Electrical and Mechanical Systems, Inspection, Rigging, Quality & Lean, and Industry 4.0.

Math Fundamentals
Math: Fractions and Decimals
Units of Measurement
OSHA Hazard Communication Labels Overview
Hazardous Materials Handling
Fall Protection
Light Curtains Overview
Introduction to OSHA
Personal Protective Equipment
Noise Reduction and Hearing
Conservation
Respiratory Safety

Lockout/Tagout Procedures
SDS and Hazard Communication
Bloodborne Pathogens
Walking and Working Surfaces
Fire Safety and Prevention
Flammable/Combustible Liquids
Hand and Power Tool Safety
Safety for Lifting Devices
Powered Industrial Truck Safety
Confined Spaces
Hand Tool Safety*
Lockout Tagout Procedures*
Power Tool Safety*

Safety Awareness in Manufacturing*
Fire Safety*
Introduction to Machine Rigging
Rigging Equipment
Rigging Inspection and Safety
ISO 9001:2015 Review
Approaches to Maintenance
Introduction to Mechanical Systems
Safety for Mechanical Work
Forces of Machines
Introduction to Physical Properties
Introduction to Mechanical Properties

Introduction to Metals
Ferrous Metals
Lean Manufacturing Overview
Total Productive Maintenance
5S Overview
5S and Hand Tool Identification*
Skills Guide - Lean**
Thread Standards and Inspection
Types of Prints & Engineering Drawings
Basics of Tolerance

Blueprint Reading
Basic Measurement
Calibration Fundamentals
Rigging Equipment Safety and Inspection*
Skills Guide - Blue Print Reading**
Augmented Worker
Electrical Units
Safety for Electrical Work

ELECTRICAL MAINTENANCE TECHNICIAN

Electrical Maintenance Technicians are responsible for the general upkeep of electrical system. They conduct routine maintenance, perform repairs, and fix faulty wiring when necessary. They may also be required to replace electrical components.

Introduction to Circuits
Introduction to Magnetism
DC Circuit Components
NEC(R) Overview
AC Fundamentals
Electrical Instruments
Electrical Print Reading
DC Power Sources
AC Power Sources
Conductor Selection
Wire Harness Components

Series Circuit Calculations
Parallel Circuit Calculations
Testing an AC Induction Motor with Multimeter*
Voltage Checks for a Variable Frequency Drive Panel*
Troubleshooting
Skills Guide - Troubleshooting**
Specs for Servomotors
Timers and Counters
Electronic Semiconductor Devices

Photonic Semiconductor Devices
Photoelectric and Ultrasonic Devices
Reduced Voltage Starting
Solid-State Relays and Starters
Relays, Contactors, and Motor Starters
Control Devices
Distribution Systems
Limit Switches and Proximity Sensors
Introduction to Electric Motors

Symbols and Diagrams for Motors
Logic and Line Diagrams
DC Motor Applications
Solenoids
AC Motor Applications
Reversing Motor Circuits
Arc Flash Safety
High Voltage Safety
Algebra Fundamentals
What Is Soldering?
Safety for Soldering

Soldering Equipment
Soldering Applications
Solder and Flux Selection
Soldering PCBs
Lead-Free Soldering 230
Essentials of Leadership
Essentials of Communication
Overview of Soldering

MECHANICAL MAINTENANCE TECHNICIAN

Mechanical Maintenance Technicians are responsible for maintaining, troubleshooting, and repairing manufacturing equipment. They may be required to install, troubleshoot and maintain mechanical devices, remove defective parts and make repairs.

Introduction to Fastener Threads
Understanding Torque
Threaded Fastener Selection
The Forces of Fluid Power
Safety for Hydraulics and Pneumatics
Introduction to Hydraulic Components
Introduction to Pneumatic Components
Introduction to Fluid Conductors

Fittings for Fluid Systems
Hole Standards and Inspection
Thread Standards and Inspection
Troubleshooting
Skills Guide - Troubleshooting
Essentials of Heat Treatment of Steel**
Nonferrous Metals
Introduction to Mechanical Systems
Safety for Mechanical Work
Forces of Machines

Power Transmission Components
Lubricant Fundamentals
Mechanical Power Variables
Bearing Applications
Spring Applications
Belt Drive Applications
Gear Applications
Clutch and Brake Applications
Distribution Systems
Introduction to Electric Motors
Symbols and Diagrams for Motors

Logic and Line Diagrams
DC Motor Applications
Solenoids
AC Motor Applications
Reversing Motor Circuits
Introduction to PLCs
Lifting and Moving Equipment
Rigging Mechanics
Algebra Fundamentals
Geometry: Lines and Angles

Geometry: Triangles
Geometry: Circles and Polygons
Trigonometry: The Pythagorean Theorem
Trigonometry: Sine, Cosine, Tangent
Essentials of Leadership
Essentials of Communication
Assembly with Mechanical Fasteners*

AUTOMATION MAINTENANCE TECHNICIAN

Automation Technicians maintain and repair robots or peripheral equipment, such as replacement of defective circuit boards, sensors, controllers, encoders, PLCs, or, end-of-arm tools, or servomotors.

Introduction to Fluid Conductors
Introduction to Smart Manufacturing
Cybersecurity for Manufacturing Basics
Machine Learning and Artificial Intelligence Applications
Data Collection Fundamentals
Skills Guide - Troubleshooting**
Belt Drive Applications
Clutch and Brake Applications
Deceleration Methods

Acceleration Methods
Introduction to PLCs
Shift Registers
Sequencer Instructions for PLCs
PLC Diagrams and Programs
Hardware for PLCs
Numbering Systems and Codes
PLC Inputs and Outputs
Basic Programming for PLCs
PLC Counters and Timers
Hand-Held Programmers of PLCs

Overview of PLC Registers
PLC Program Control Instructions
PLC Installation Practices
PID for PLCs
Data Manipulation
Introduction to Robotics
Automated Systems and Controls
Robot Components
End Effectors
Robot Applications
Robot Axes and Pathways

Robot Sensors
Robot Maintenance
Robot Power and Drive Systems
Robot Installations
Robot Control Systems
Vision Systems
Industrial Network Integration
Robot Safety
Robot Troubleshooting
Concepts of Robot Programming

Robot Applications: Palletizing
Robot Applications: Machine Tending
Introduction to Collaborative Robots
Skills Guide - Robotics**
Essentials of Leadership
Essentials of Communication
Voltage Checks for a Variable Frequency Drive Panel

PRODUCTION MAINTENANCE TECHNICIAN

A Production Maintenance Technician performs preventive maintenance and skilled repairs on complex electrical and mechanical production equipment and systems, sensor or feedback systems, hydraulics, or pneumatics.

Introduction to CNC Machines
Control Panel Functions for the CNC Lathe
Control Panel Functions for the CNC Mill
The Forces of Fluid Power
Preventive Maintenance for Fluid Systems
Introduction to Fluid Systems
Piping and Instrumentation Diagrams
Actuator Applications
Hydraulic Power Variables

Hydraulic Power Sources
Pneumatic Power Variables
Pneumatic Power Sources
Hydraulic Control Valves
Hydraulic Schematics and Basic Circuit Design
Pneumatic Control Valves
Pneumatic Schematics and Basic Circuit Design
Hydraulic Fluid Selection
Contamination and Filter Selection
Hydraulic Principles and System

Design
Interpreting Prints
Conducting Kaizen Events
Skills Guide - Troubleshooting**
Benchwork and Layout Operations
Relays, Contactors, and Motor Starters
Control Devices
Limit Switches and Proximity Sensors
Motor Drive Systems and Maintenance

Electrical Maintenance for Motor Drive Systems
Mechanical Maintenance for Motor Drive Systems
Essentials of Leadership
Essentials of Communication
Overview of Soldering
Welding Safety Essentials
PPE for Welding
Welding Fumes and Gases Safety
Electrical Safety for Welding
Introduction to Welding

Introduction to Welding Processes
Plasma Cutting
SMAW Applications
GMAW Applications
What Is Oxyfuel Welding?
Shielded Metal Arc Welding*
Gas Metal Arc Welding*

*: VR Lab **: Skills Guide