



## MICHIGAN MANUFACTURING TECHNOLOGY CENTER

### PROFESSIONAL DEVELOPMENT

#### LEARNING PLANS FOR MANUFACTURING JOB ROLES

Training Packages from Tooling U-SME offer quick-start, progressive road maps in various functional areas that allow manufacturers to build career paths for employees. They are intended to enhance your existing OJT and help you create a job progression plan. Unlike many other training programs, these packages require minimal preparation. They are efficient, effective training, 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 MECHATRONICS JOB ROLES

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

# MECHATRONICS

## MECHATRONICS FUNDAMENTALS

Math Fundamentals Math: Fractions and Decimals Units of Measurement Basics of Tolerance Blueprint Reading Basic Measurement Calibration Fundamentals Hole Standards and Inspection	Thread Standards and Inspection Intro 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 Introduction to Physical Properties Introduction to Mechanical Properties	Introduction to Metals Ferrous Metals Lean Manufacturing Overview ISO 9001:2015 Review Approaches to Maintenance Total Productive Maintenance 5S Overview Electrical Units	Safety for Electrical Work Introduction to Mechanical Systems Safety for Mechanical Work Forces of Machines
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## ELECTRICAL PRODUCTION

Algebra Fundamentals Geometry: Lines and Angles Geometry: Triangles Geometry: Circles and Polygons Trigonometry: The Pythagorean Theorem	Trigonometry: Sine, Cosine, Tangent Essentials of Heat Treatment of Steel Troubleshooting Introduction to CNC Machines Control Panel Functions for the	CNC Lathe Control Panel Functions for the CNC Mill Shift Registers Introduction to Circuits Introduction to Magnetism DC Circuit Components	NEC Overview AC Fundamentals Electrical Instruments Electrical Print Reading Conductor Selection Series Circuit Calculations Parallel Circuit Calculations	Limit Switches and Proximity Sensors Lubricant Fundamentals Overview of Soldering Relays, Contractors, and Motor Starters Control Devices	Distribution Systems Introduction to Electric Motors Logic and Line Diagrams Essentials of Leadership Essentials of Communication
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## MECHATRONICS PRODUCTION

Algebra Fundamentals Geometry: Lines and Angles Geometry: Triangles Geometry: Circles and Polygons Trigonometry: The Pythagorean Theorem Trigonometry: Sine, Cosine, Tangent Essentials of Heat Treatment	of Steel Nonferrous Metals Troubleshooting Series Circuit Calculations Parallel Circuit Calculations Battery Selection Bearing Applications Spring Applications Belt Drive Applications Gear Applications	Reversing Motor Circuits Specs for Servomotors Reduced Voltage Starting 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 Preventative Maintenance for Fluid Systems Lubricant Fundamentals Mechanical Power Variables Clutch and Brake Applications Intro to Machine Rigging Rigging Equipment	Rigging Inspection and Safety Rigging Mechanics Intro to Fastener Threads Overview of Threaded Fasteners Tools for Threaded Fasteners Overview of Non-Threaded Fasteners Understanding Torque Threaded Fastener Selection	Distribution Systems Introduction to Electric Motors Symbols and Diagrams for Motors Logic and Line Diagrams DC Motor Applications Solenoids AC Motor Applications Essentials of Leadership Essentials of Communication
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## AUTOMATION TECHNICIAN

Bearing Applications Spring Applications Belt Drive Applications Gear Applications Introduction to PLCs Hardware for PLCs Basics of Ladder Logic Numbering Systems and Codes PLC Inputs and Outputs	Basic Programming PLC Timers and Counters Networking for PLCs Hand-Held Programmers for PLCs Overview of PLC Registers PLC Program Control Instructions Sequencer Instructions for PLCs	PLC Installation Practices PID for PLCs Data Manipulation Robot Components End Effectors Robot Axes Robot Sensors Robot Maintenance Robot Installations Vision Systems	Industrial Network Integration 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 Mechanical Power Variables Clutch and Brake Applications Intro to Machine Rigging Rigging Equipment Rigging Inspection and Safety Rigging Mechanics Robot Safety Robot Troubleshooting Concepts of Robot	Programming Intro to Fastener Threads Overview of Threaded Fasteners Tools for Threaded Fasteners Overview of Non-Threaded Fasteners Understanding Torque Threaded Fastener Selection
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## ELECTRICAL TECHNICIAN

Nonferrous Metals Battery Selection Bearing Applications Spring Applications Belt Drive Applications Gear Applications Reversing Motor Circuits	Specs for Servomotors Reduced Voltage Starting 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 Mechanical Power Variables Clutch and Brake Applications	Intro to Machine Rigging Rigging Equipment Rigging Inspection and Safety Rigging Mechanics Intro to Fastener Threads Overview of Threaded Fasteners	Tools for Threaded Fasteners Overview of Non-Threaded Fasteners Understanding Torque Threaded Fastener Selection Distribution Systems Symbols and Diagrams for	Motors DC Motor Applications Solenoids AC Motor Applications
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## FLUID SYSTEMS TECHNICIAN

Benchwork and Layout Operations Introduction to CNC Machines Control Panel Functions for the CNC Lathe Control Panel Functions for the CNC Mill Introduction to Circuits Introduction to Magnetism	DC Circuit Components NEC Overview AC Fundamentals Electrical Instruments Electrical Print Reading DC Power Sources AC Power Sources Conductor Selection Limit Switches and Proximity	Sensors 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 Circuit Design Actuator Applications Hydraulic Fluid Selection Contamination and Filter Selection Hydraulic Principles and System Design Welding Safety Essentials	PPE for Welding Welding Fumes and Gases Safety Electrical Safety for Welding Introduction to Welding Introduction to Welding Processes Overview of Soldering Plasma Cutting	SMAW Applications GMAW Applications What Is Oxyfuel Welding? Oxyfuel Welding Applications Relays, Contractors, and Motor Starters Control Devices Distribution Systems
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