



---

CLASS CATALOG



# Manufacturing Training for Everyone.

Manufacturing is a broad industry—and we have an extensive training catalog to match it. With more than 400 unique titles, we provide training for practically every role. Every class is tailored specifically to a manufacturing audience and is reviewed by industry experts to ensure that our training meets your organizational needs.

This catalog presents **TOOLINGU.COM** training organized into general industry niches. However, our training is easily arranged into individually tailored curricula that target the learners' specific needs. Contact a Toolingu.com representative to learn how we can help you develop a structured, blended-learning program for your organization.

## Summary of Industries Served

### Foundational

TOPIC	HIGHLIGHTS
Inspection	linear measurement, GD&T, calibration, CMMs, optical comparators, hole & thread inspection
Materials	steel grades, heat treatment, plastic types
Quality	lean, SPC, TPM, 5S, value stream mapping, kaizen teams, troubleshooting
Rigging	lifting equipment, safety and inspection, load calculations
Safety	OSHA guidelines, PPE, lockout/tagout, MSDS, machine guarding, hand/power tool safety
Shop Essentials	shop math, tolerances, print reading, geometry and trig
Supervisory Essentials	communication, performance management, conflict resolution, coating estimating

### Assembly

TOPIC	HIGHLIGHTS
Adhesives	dispensing equipment, joint preparation
Fasteners	thread specifications, fastener selection, proper torquing
Soldering	PCB soldering, lead-free soldering

### Machining

TOPIC	HIGHLIGHTS
Abrasives	surface grinding, centerless grinding, cylindrical grinding, wheel grades, dressing and truing
CNC	G code programming, offsets, toolpath calculations, canned cycles
CNC Controls: GE Fanuc	offset changes, program execution, proving out new setups
CNC Controls: Haas	offset changes, program execution, proving out new setups
CNC Controls: Mazak	offset changes, program execution, proving out new setups
Manual Machining	benchwork and layout, mill/lathe operation, holmaking, threading on an engine lathe
Metal Cutting	speeds and feeds, tool grades, cutter geometry, optimizing tool life
Workholding	locating principles, fixture design

### Maintenance

TOPIC	HIGHLIGHTS
Electrical Systems	Ohm's Law, circuit calculations, electrical print reading, use of the NEC
Hydraulics/Pneumatics	power sources, control valves, actuators, fluid maintenance, system design
Mechanical Systems	power variables, lubrication, gear applications, bearings, belt drives, clutches and brakes
Motor Controls	ladder/line diagrams, control devices, motor theory
PLCs	ladder logic, inputs/outputs, hardware and installations
Robotics	component maintenance, sensors, end effectors, installation, and troubleshooting

### Welding and Fabrication

TOPIC	HIGHLIGHTS
Press Brake	bend types, press brake controls
Stamping	die components, coil handling, die setting
Welding	stick welding (SMAW), MIG (GMAW), TIG (GTAW), flux core (FCAW)

# Class Catalog

## FOUNDATIONAL



### INSPECTION DEPARTMENT

- Basic Measurement 110 ■■■
- Linear Instrument Characteristics 115 ■■
- Basics of the CMM 120 ■■
- Basics of the Optical Comparator 130 ■
- Surface Measurement 140 ■
- Overview of Threads 150 ■
- Intro to GD&T 200 ■■■
- Calibration Fundamentals 210 ■■
- Inspecting with CMMs 220 ■
- Inspecting with Optical Comparators 230 ■
- Hole Inspection 240 ■■
- Thread Inspection 250 ■■
- Hardness Testing 260 ■
- Measuring System Analysis 300 ■
- Interpreting GD&T 310 ■■



### MATERIALS DEPARTMENT

- Intro to Materials 100 ■
- Structure of Metals 110 ■
- Overview of Plastic Materials 115
- Mechanical Properties of Metals 120 ■■■
- Physical Properties of Metals 130 ■■
- Overview of Properties for Plastics 135
- Metal Manufacturing 140 ■■
- Overview of Plastic Processes 145
- Metal Classification 150 ■■
- Ferrous Metals and Alloys 210 ■
- Nonferrous Metals and Alloys 220 ■
- Heat Treatment of Steel 230 ■■
- Plastics 240 ■
- Ceramics 250 ■
- Principles of Injection Molding 255
- Principles of Thermoforming 265



### QUALITY DEPARTMENT

- Quality Overview 100 ■■
- ISO 9000 Overview 110 ■
- Approaches to Maintenance 120 ■
- Lean Manufacturing Overview 130 ■■
- Intro to Supply Chain Management 140 ■
- Total Productive Maintenance Overview 150 ■
- 5S Overview 155 ■
- Cell Design and Pull Systems 160 ■■
- Intro to Six Sigma 170 ■
- Troubleshooting: Identifying Problems 180
- Troubleshooting: Understanding Causes and Effects 182
- Troubleshooting: Taking Corrective Actions 184
- Conducting an Internal Audit 200 ■
- SPC Overview 210 ■■■
- TS 16949:2002 Overview 220
- Metrics for Lean 230 ■
- Process Flow Charting 240
- Strategies for Setup Reduction 250 ■■
- Approaches to Quality Management 255
- Conducting Kaizen Events 260
- Value Stream Mapping: The Present State 300
- Value Stream Mapping: The Future State 305
- Six Sigma Goals and Tools 310
- Managing Practices for Total Quality 320



### RIGGING

- Intro to Machine Rigging 110
- Rigging Equipment 120
- Lifting and Moving Equipment 130
- Rigging Inspection and Safety 210
- Rigging Mechanics 220



### SAFETY DEPARTMENT

- Intro to OSHA 100 ■
- Fire Safety and Prevention 110 ■■
- Bloodborne Pathogens 115 ■
- Personal Protective Equipment 120 ■■
- Lockout/Tagout Procedures 130 ■■
- Safety for Lifting Devices 135 ■
- Machine Guarding 140 ■
- Hand and Power Tool Safety 145 ■
- Environmental Safety Hazards 150 ■■
- Flammable/Combustible Liquids 155 ■
- MSDS and Hazard Communication 160 ■■
- Metalworking Fluid Safety 165 ■
- Noise Reduction and Hearing Conservation 170 ■
- Walking and Working Surfaces 180 ■
- Confined Spaces 190 ■
- Respiratory Safety 195 ■
- Powered Industrial Truck Safety 210 ■



### SHOP ESSENTIALS DEPARTMENT

- Math: Fundamentals 100 ■■
- Math: Fractions and Decimals 105 ■■
- Math: Units of Measurement 115 ■■
- Basics of Tolerance 120 ■■
- Blueprint Reading 130 ■■
- Geometry: Lines and Angles 155 ■
- Geometry: Triangles 165 ■■
- Shop Geometry Overview 170 ■■
- Geometry: Circles and Polygons 185 ■
- Shop Algebra Overview 200 ■■
- Trig: Pythagorean Theorem 205 ■■
- Shop Trig Overview 210 ■■
- Trig: Sine, Cosine, and Tangent 215 ■■
- Statistics 220 ■■
- Trig: Sine Bar Applications 225 ■■
- Interpreting Blueprints 230 ■■
- Concepts of Calculus 310 ■



### SUPERVISORY ESSENTIALS

- Essentials of Leadership 110 ■
- Essentials of Communication 120 ■
- Managing Performance: Best Practices 130 ■
- Managing Performance: Corrective Actions 135 ■
- Basics of Manufacturing Costs 140
- Intro to Managerial Accounting 145
- Conflict Resolution Principles 150 ■
- Conflict Resolution for Different Groups 155 ■
- Team Leadership 160 ■
- Managing the Diverse Workplace 210 ■
- Harassment and Discrimination 215 ■
- Performance Management and the Law 230 ■

FEATURE KEY	
■	Contains Lab
■	Contains Simulator
■	Available in Spanish
■	Available in Simplified Chinese
■	Coming Soon

## ASSEMBLY



### ADHESIVES DEPARTMENT

Intro to Adhesive Bonding 110  
Basics of the Bonding Process 120  
Intro to Adhesive Properties 130

Types of Adhesives 140  
Surface Preparation 210  
Steps for Adhesive Application 220



### FASTENERS DEPARTMENT

Intro to Assembly 100  
Safety for Assembly 105 ■  
Intro to Fastener Threads 110 ■  
Overview of Threaded Fasteners 117  
Tools for Threaded Fasteners 120

Overview of Non-Threaded Fasteners 125  
Intro to Fastener Ergonomics 130  
Properties for Fasteners 200  
Understanding Torque 210 ■  
Threaded Fastener Selection 215



### SOLDERING DEPARTMENT

What Is Soldering? 110  
Safety for Soldering 115 ■  
Soldering Equipment 130  
Soldering Applications 200 ■

Solder and Flux Selection 210  
Soldering PCBs 220  
Lead-Free Soldering 230 ■

## MACHINING



### ABRASIVES DEPARTMENT

Intro to Abrasives 100 ■  
What Is Grinding? 110 ■■  
Grinding Processes 120 ■■■  
Grinding Variables 200 ■■  
Grinding Wheel Materials 210 ■  
Grinding Wheel Geometry 220

Dressing and Truing 230 ■  
Surface Grinder Operation 240  
Cylindrical Grinder Operation 250  
Centerless Grinder Operation 260  
Setup for Centerless Grinders 320



### CNC DEPARTMENT

History and Definition of CNC 100 ■  
Mechanics of CNC 110 ■■  
Basics of the CNC Turning Center 120 ■■■  
Basics of the CNC Machining Center 130 ■■■  
Basics of the CNC Swiss-Type Lathe 135 ■  
CNC Coordinates 140 ■■■  
Part Program 150 ■■■  
CAD/CAM Overview 160 ■  
CNC Manual Operations 200 ■■■

CNC Offsets 210 ■■■  
CNC Specs for the Mill 220 ■■  
CNC Specs for the Lathe 225 ■■  
Creating a Turning Program 280 ■■  
Turning Calculations 285 ■  
Creating a Milling Program 290 ■■  
Milling Calculations 295 ■  
Canned Cycles 310 ■■



### CNC CONTROLS: GE FANUC DEPARTMENT

GE Fanuc Mill: Control Panel Overview 250 ■■  
GE Fanuc Lathe: Control Panel Overview 255 ■■  
GE Fanuc Mill: Entering Offsets 260 ■■  
GE Fanuc Lathe: Entering Offsets 265 ■■  
GE Fanuc Mill: Locating Program Zero 270 ■■  
GE Fanuc Lathe: Locating Program Zero 275 ■■

GE Fanuc Mill: Program Execution 280 ■■  
GE Fanuc Lathe: Program Execution 285 ■■  
GE Fanuc Mill: Program Storage 310 ■■  
GE Fanuc Lathe: Program Storage 315 ■■  
GE Fanuc Mill: First Part Runs 320 ■■  
GE Fanuc Lathe: First Part Runs 325 ■■



### CNC CONTROLS: HAAS DEPARTMENT

Haas Mill: Control Panel Overview 250 ■  
Haas Lathe: Control Panel Overview 255 ■  
Haas Mill: Entering Offsets 260 ■  
Haas Lathe: Entering Offsets 265 ■  
Haas Mill: Locating Program Zero 270 ■  
Haas Lathe: Locating Program Zero 275 ■

Haas Mill: Program Execution 280 ■  
Haas Lathe: Program Execution 285 ■  
Haas Mill: Program Storage 310 ■  
Haas Lathe: Program Storage 315 ■  
Haas Mill: First Part Runs 320 ■  
Haas Lathe: First Part Runs 325 ■



### CNC CONTROLS: MAZAK™ DEPARTMENT

Mazak Mill: Control Panel Overview 250 ■  
Mazak Lathe: Control Panel Overview 255 ■  
Mazak Mill: Safety for the Mill 260 ■  
Mazak Lathe: Safety for the Lathe 265 ■  
Mazak Mill: Locating Program Zero 270 ■  
Mazak Lathe: Locating Program Zero 275 ■  
Mazak Mill: Entering Offsets 280 ■

Mazak Lathe: Entering Offsets 285 ■  
Mazak Mill: Program Execution 290 ■  
Mazak Lathe: Program Execution 295 ■  
Mazak Mill: Program Storage 310 ■  
Mazak Lathe: Program Storage 315 ■  
Mazak Mill: First Part Runs 320 ■  
Mazak Lathe: First Part Runs 325 ■



### MANUAL MACHINING DEPARTMENT

Basics of the Manual Mill 110  
Basics of the Engine Lathe 115 ■  
Overview of Manual Mill Setup 200  
Overview of Engine Lathe Setup 205  
Benchmark and Layout Operations 210

Manual Mill Operation 220  
Engine Lathe Operation 225 ■  
Holemaking on the Mill 230  
Threading on the Engine Lathe 235

FEATURE KEY	
■	Contains Lab
■	Contains Simulator
■	Available in Spanish
■	Available in Simplified Chinese
■	Coming Soon



## METAL CUTTING DEPARTMENT

- Metal Removal Processes 110 ■■
- Safety for Metal Cutting 115 ■■
- What Is Cutting? 120 ■■
- Machines for Metal Cutting 130 ■■
- Cutting Processes 140 ■■
- Sawing Fundamentals 155 ■■
- Intro to Screw Machining 160 ■■
- Cutting Variables 200 ■■
- Cutting Fluids 210 ■■
- Band Saw Blade Selection 215 ■■
- Cutting Tool Materials 220 ■■
- Carbide Grade Selection 230 ■■
- Tool Geometry 240 ■■
- Milling Geometry 245 ■■
- Drill Geometry 247 ■■
- ANSI Insert Selection 250 ■■
- Toolholders for Turning 260 ■■
- Speed and Feed Selection 300 ■■
- Optimizing Insert Life 305 ■■
- High-Speed Machining 310 ■■
- Hard Turning 315



## WORKHOLDING DEPARTMENT

- Intro to Workholding 104 ■■
- Supporting and Locating Principles 106 ■■
- Locating Devices 107 ■■
- Clamping Basics 108 ■■
- Chucks, Collets, and Vises 110 ■■
- Fixture Body Construction 200 ■■
- Fixture Design Basics 210 ■■
- Drill Bushing Selection 230 ■■

## MAINTENANCE



## ELECTRICAL SYSTEMS DEPARTMENT

- Electrical Units 110 ■■
- Safety for Electrical Work 115 ■■
- Intro to Circuits 120 ■■
- Intro to Magnetism 130 ■■
- DC Circuit Components 140 ■■
- NEC Overview 150 ■■
- Series Circuit Calculations 200
- Parallel Circuit Calculations 205
- AC Fundamentals 210
- Electrical Instruments 220
- Electrical Print Reading 225 ■■
- DC Power Sources 230 ■■
- AC Power Sources 235 ■■
- Conductor Selection 240 ■■
- Battery Selection 250 ■■



## HYDRAULICS AND PNEUMATICS DEPARTMENT

- Intro to Fluid Systems 100
- Safety for Hydraulics and Pneumatics 105 ■■
- The Forces of Fluid Power 110
- Intro to Hydraulic Components 120 ■■
- Intro to Pneumatic Components 125
- Intro to Fluid Conductors 130
- Fittings for Fluid Systems 135
- Preventive Maintenance for Fluid Systems 140
- Hydraulic Power Variables 200 ■■
- Pneumatic Power Variables 205
- Hydraulic Power Sources 210
- Pneumatic Power Sources 215
- Fluid System Print Reading 220
- Hydraulic Control Valves 230 ■■
- Pneumatic Control Valves 235
- Actuator Applications 240 ■■
- Basic Hydraulic System Design 310
- Basic Pneumatic Circuit Design 315
- Hydraulic Fluid Selection 320 ■■
- Contamination and Filter Selection 330 ■■
- Hydraulic Principles and System Design 340 ■■



## MECHANICAL SYSTEMS DEPARTMENT

- Intro to Mechanical Systems 100
- Safety for Mechanical Work 105
- Forces of Machines 110 ■■
- Power Transmission Components 120
- Lubricant Fundamentals 130 ■■
- Mechanical Power Variables 200 ■■
- Bearing Applications 210 ■■
- Spring Applications 220
- Belt Drive Applications 230 ■■
- Gear Geometry 240 ■■
- Gear Applications 245
- Clutch and Brake Applications 250



## MOTOR CONTROLS DEPARTMENT

- Intro to Electric Motors 200 ■■
- Symbols and Diagrams for Motors 210
- Logic and Line Diagrams 220
- DC Motor Applications 230 ■■
- Solenoids 235 ■■
- AC Motor Applications 240
- Contactors and Motor Starters 250 ■■
- Control Devices 260 ■■
- Reversing Motor Circuits 310
- Distribution Systems 320
- Specs for Servomotors 330
- Timers and Counters 340 ■■
- Electronic Semiconductor Devices 350
- Photonic Semiconductor Devices 355
- Limit Switches and Proximity Sensors 360 ■■
- Photoelectric and Ultrasonic Devices 365 ■■
- Reduced Voltage Starting 370
- Solid-State Relays and Starters 375 ■■
- Deceleration Methods 380
- Acceleration Methods 385



## PLCs DEPARTMENT

- Intro to PLCs 200 ■■
- Hardware for PLCs 210 ■■
- Basics of Ladder Logic 220 ■■
- Numbering Systems and Codes 230
- PLC Inputs and Outputs 240 ■■
- Basic Programming 250
- PLC Timers and Counters 260
- Networking for PLCs 270 ■■
- Hand-Held Programmers of PLCs 280 ■■
- PLC Diagrams and Programs 300
- Overview of PLC Registers 305
- PLC Program Control Instructions 310 ■■
- Math for PLCs 320
- Sequencer Instructions for PLCs 330
- PLC Installation Practices 340 ■■
- PID for PLCs 350
- Data Manipulation 360
- Shift Registers 370



## ROBOTICS

- Intro to Robotics 110
- Robot Safety 115
- Robot Components 120
- End Effectors 125
- Applications for Robots 130
- Robot Axes 140
- Robot Sensors 150
- Robot Troubleshooting 160
- Robot Maintenance 170
- Concepts of Robot Programming 210
- Robotic Drives, Hardware, and Components 220
- Robot Installations 230
- Robotic Control Systems 240
- Vision Systems 250
- Industrial Network Integration 260 ■■

FEATURE KEY	
■	Contains Lab
■	Contains Simulator
■	Available in Spanish
■	Available in Simplified Chinese
■	Coming Soon

## WELDING AND FABRICATION



### PRESS BRAKE DEPARTMENT

Press Brake Safety 100  
 Press Brake Components 110 ■  
 Bending Fundamentals 120 ■

Die Bending Operations 130  
 Operating the Press Brake 200  
 Press Brake Specifications 220 ■



### STAMPING DEPARTMENT

Press Basics 110 ■  
 Stamping Safety 115 ■■  
 Punch and Die Operations 120 ■■  
 Die Components 130 ■  
 Coil Handling Equipment 140 ■  
 Die Cutting Variables 200 ■■

Monitoring Press Operations 220 ■■  
 Guiding System Components 230 ■  
 Stripper System Components 235 ■  
 Coil Loading Procedures 250 ■  
 Die Setting Procedures 300 ■



### WELDING DEPARTMENT

What Is Oxyfuel Welding? 100  
 Oxyfuel Welding Safety 105  
 What Is Arc Welding? 110 ■■  
 Arc Welding Safety 115 ■■  
 Arc Welding Processes 120 ■■■  
 Overview of Weld Types 130 ■■■  
 Electrical Power for Arc Welding 140 ■  
 Intro to SAW 160 ■  
 Ferrous Metals for Welding 200 ■■  
 Nonferrous Metals for Welding 205 ■  
 Oxyfuel Welding Applications 207

SMAW Applications 210 ■■■  
 GMAW Applications 220 ■■■  
 FCAW Applications 230 ■■■  
 GTAW Applications 240 ■■  
 Arc Welding Symbols and Codes 250 ■■  
 SAW Applications 255 ■  
 Arc Welding Power Sources 260 ■  
 Plasma Cutting 265  
 Electrode Selection 270 ■■  
 Visual Inspection of Welds 280  
 Arc Welding Aluminum Alloys 310 ■

### Coming Soon

TOPIC	HIGHLIGHTS
Coatings	curing process, manual application, VOCs, and technologies such as power coating and UV-curing
Composites	manual layup, manual sprayup, vacuum bagging, mold prep
Machining Exotic Alloys	types of exotic metals, machining titanium, machining superalloys such as Inconel, Hastelloy, etc.

#### FEATURE KEY

- Contains Lab
- Contains Simulator
- Available in Spanish
- Available in Simplified Chinese
- Coming Soon

# Online Training Is More Than a Class List.

Training requires more than content. You need training that is organized into logical, focused competencies that teach your people exactly what they need to do their jobs.

All **TOOLINGU.COM** training is organized into job-specific competencies that contain the exact training required for common industry jobs. These competencies help you structure a training program that defines learning goals, ties learning to hands-on tasks, and helps you develop people within your organization. Even better—you can customize every competency with unique online class lists and hands-on tasks to fit your specific organizational needs.

Contact a **TOOLINGU.COM** representative and learn how we can help you transform your manufacturing training.

