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TOOLINGU



introducing Tooling U-SME

Tooling U-SME generates high quality learning solutions for the manufacturing community. Validated by the industry's leading experts, our class content, professional services, and competency mapping align to today's job-related responsibilities for current and future generations of manufacturers. For more than 80 years, we have been successfully building manufacturing training programs that harmonize workforce training with defined business goals and objectives. Over 240,000 individuals and over 5,000 companies and 400 educational institutions throughout the global manufacturing community rely upon us to strengthen the skills of their manufacturing workforce.

CREDENTIALS

Tooling U-SME has been a trusted source in manufacturing education for over 80 years. Our integrity and commitment ensure we stay aligned to national credentials including SME Lean, Certified Manufacturing Engineer and Certified Manufacturing Technologist, National Institute for Metalworking Skills (NIMS), Manufacturing Skill Standards Council (MSSC), American Welding Society (AWS), and Siemens Mechatronics certifications, and can also be mapped to individual or state curriculum requirements.

THE RIGHT TRAINING. THE RIGHT SOLUTIONS.

- ▀ BOOST OPERATIONS EFFECTIVENESS
- ▀ IMPROVE QUALITY
- ▀ REDUCE SCRAP
- ▀ EXPEDITE ON-BOARDING
- ▀ HEIGHTEN QUALITY CAPABILITIES
- ▀ ENHANCE PRODUCTION
- ▀ CROSS TRAINING GUARDS AGAINST WORKFORCE SKILLS GAP
- ▀ ROLLOUT NEW TECHNOLOGIES
- ▀ SHIFT FROM "TRIBAL KNOWLEDGE" TO FORMAL LEARNING

summary of departments



TOPIC	HIGHLIGHTS
Abrasives	adhesive bonding, bonding process, adhesive properties, types of adhesives, surface preparation
Additive Manufacturing	intro to additive manufacturing, safety, the basic process, and methods and materials
Adhesives	intro to abrasives, what is grinding?, grinding processes, grinding variables, grinding wheel materials
CNC Controls: GE FANUC	control panel, entering offsets, locating program zero, program execution, program storage
CNC Controls: HAAS	control panel, entering offsets, locating program zero, program execution, program storage
CNC Controls: MAZAK	control panel, entering offsets, locating program zero, program execution, program storage
CNC	history and definition of CNC, mechanics of CNC, CNC coordinates, part program, CAD/CAM overview
Coatings	coating composition, surface preparation, process of applying coatings, coating defects
Composites	intro, safety for composites, overview of composite processes, traditional composites, advanced materials
Electrical Systems	electrical nits, safety for electric work, intro to circuits, intro to magnetism, DC circuit components
Fasteners	assembly, safety for assembly, fastener threads, overview of threaded fasteners, fastener ergonomics
Hydraulics/Pneumatics	intro to fluid systems, the forces of fluid power, intro to fluid conductors, fittings for fluid systems
Inspection	basic measurement, linear instrument characteristics, basics of the CMM, surface measurement
Manual Machining	basics of the manual mill, basics of the engine lathe, manual mill operation, holmaking on the mill
Materials	intro to materials, structure of metals, overview of plastic materials, mechanical properties of metals
Mechanical Systems	intro to mechanical systems, safety of mechanical work, forces of machines, lubricant fundamentals
Metal Cutting	metal removing processes, safety for metal cutting, what is cutting?, machines for metal cutting
Motor Controls	intro to electric motors, logic and line diagrams, DC motor applications, solenoids, AC motor applications
PLCs	intro to PLCs, basics of ladder logic, numbering systems and codes, basic programming
PLCs: SIEMENS	numbers, codes and data types for Siemens PLCs, Siemens PLC communication, Siemens SIMATIC modular PLCs, PLC Programming Concepts
Press Brake	press brake safety, press brake components, bending fundamentals, die bending operations
Quality	quality overview, ISO 9000 overview, approaches to maintenance, lean manufacturing overview
Rigging	intro to machine rigging, rigging equipment, lifting and moving equipment, rigging mechanics
Robotics	intro to robotics, robot safety, robot components, end effectors, robot axes, robot sensors
Safety	intro to OSHA, fire safety and prevention, personal protective equipment, lockout/tagout procedures
Shop Essentials	fundamentals, fractions and decimals, units of measurements, basics of tolerance, blueprint reading
Soldering	what is soldering, safety for soldering, soldering equipment, soldering applications
Stamping	press basics, stamping safety, punch and die operations, die components, die cutting variables
Supervisor Essentials	essentials of leadership, essentials of communication, managing performance, conflict resolution principles
Welding	oxyfuel welding, arc welding, arc welding safety, overview of weld types, intro to submerged arc welding
Workholding	intro to workholding, locating devices, clamping basics, fixture body construction, drill bushing selection

foundational

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INSPECTION DEPARTMENT

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machining

Online



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





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machining

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Instructor-Led

- > Computer Numerical Control (CNC) Fundamentals
- > Programmable Logic Controllers (PLCs)
- > High-Speed, High-Power Machining
- > Machining Process Optimization Program
- > Precision Grinding & Abrasive Machining Certificate Program
- > Modern Grinding Technology
- > Practical Applications of Machine Tool Metrology
- > Metalworking Fluid Management Certificate Program
- > High-Speed Endmilling for Die, Mold, Aerospace, Racing, and Prototype Shops

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maintenance

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Instructor-Led

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 - Hydraulic Connectors and Conductors
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 - Hydraulic Troubleshooting using Schematics
- Level 1 Pneumatics
 - Industrial Electrical Fundamentals
 - AC Motor Controls and Relay Ladder Logic
- Level 1 PLC Fundamentals
 - Variable Frequency Drives
 - Troubleshooting Electrical Systems with Schematics
- Introduction to Lubrication
- Mechanical Fundamentals

stamping/forming/fabricating

Online



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Instructor-Led

- > Coil Slitting Fundamentals
- > Coil Slitting & Leveling Certificate Program
- > Laser Cutting Certificate Program
- > Metal Formability Certificate Program
- > Metal Stamping Press Maintenance Certificate Program
- > Stamping Die Certificate Program

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welding



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composites processing



Online



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- > Introduction to Composites
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engineering/management

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- > APQP/FMEA/Control Plans/Error Proofing
- > Advanced Product Quality Planning (APQP)
- > Computerized Maintenance Management System (CMMS) Certificate Program
- > Concurrent Engineering
- > Cycle Time Management/Reengineering
- > Design of Experiments (DOE)
- > Design for Manufacturability and Assembly (DFM/DFA)
- > Failure Mode and Effects Analysis (FMEA) Fundamentals
- > GD&T for DFM
- > GD&T
- > GD&T Overview
- > Global Supply Chain Management
- > How to Coach Your People to Think Independently
- > Industrial Engineering Fundamentals
- > Integrating Green Manufacturing and Lean
- > Introduction to Lean: Overview of the Lean Toolbox
- > Kaizen Workshop
- > Kanban: Inventory and Demand Management
- > Lean Product Development
- > Manufacturing Technology Fundamentals
- > Measurement Inspection and Gaging Level 1
- > Measurement Inspection and Gaging Level 2
- > Planning Manufacturing Cells
- > Precision Machine Design
- > Project Risk Management
- > Rapid and Accurate Cost Estimating and Quoting
- > Rapid Prototyping Fundamentals
- > Rapid Technologies and Additive Manufacturing Certificate Programs
- > Six Sigma Green Belt
- > Six Sigma Yellow Belt
- > SMED: Setup / Changeover Reduction
- > Strategic Project Management
- > Statistical Process Control (SPC) Fundamentals
- > 5S: Systematic Organization of the Workplace
- > The Human Side of Lean
- > Tolerance Stack-Up Analysis
- > Understanding the Tools and Best Practices of Lean Manufacturing
- > Value Analysis and Value Engineering (VA/VE)
- > Value Stream Mapping: Diagram the Information and Material Flows in Your Business
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assembly/final stage processes

Online



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knowledge earned

Tooling U-SME offers assessments, certifications, and certificate programs that help the manufacturing community benchmark learning against objectives. Our programs, developed by a range of experienced industry professionals, validate the knowledge and skills of individuals to ensure they are well-equipped to meet the requirements for their manufacturing profession.

ASSESSMENTS

Online Assessments

Assess machining, welding and fabrication, maintenance, assembly and foundational skills, and much more.

Practice and Self-Evaluation Tests

Validate manufacturing technology, manufacturing engineering, and electronic/electrical engineering technology skills to ensure employees are meeting industry standards in these fields.

Green Manufacturing Outcome Assessments

Identify areas of success and improvement related to green manufacturing initiatives.

Online Review Programs

Provide essential review of key concepts related to Certified Manufacturing Technologist (CMfgT) and Lean Bronze Certification, and evaluate skills with the pre- and post-test tools.

Supplemental Test Questions

Utilize for existing employee evaluation programs, including out-of-the-box questions and questions tailored to meet your specific needs.

CERTIFICATIONS AND CERTIFICATES

Lean Certification:

SME, along with three other partners – Association for Manufacturing Excellence (AME), American Society for Quality (ASQ), and the Shingo Prize for Operational Excellence – have formed an alliance to establish the standard for continuing manufacturing improvement and Lean practices.

> **Bronze Level:**

Begins the industry-leading Lean Certification program and validates employees' tactical Lean experience and solid understanding of Lean principles and tools.

> **Silver Level:**

Expands upon employees' knowledge and understanding of Lean principles and tools. Silver level candidates should be fully capable of orchestrating the transformation of a complete value stream.

> **Gold Level:**

Focuses on the strategic transformation of the enterprise. Gold level candidates have sufficient Lean experience and knowledge to teach Lean strategy and leadership, AND completely transform an organization.

Certified Manufacturing Technologist (CMfgT)

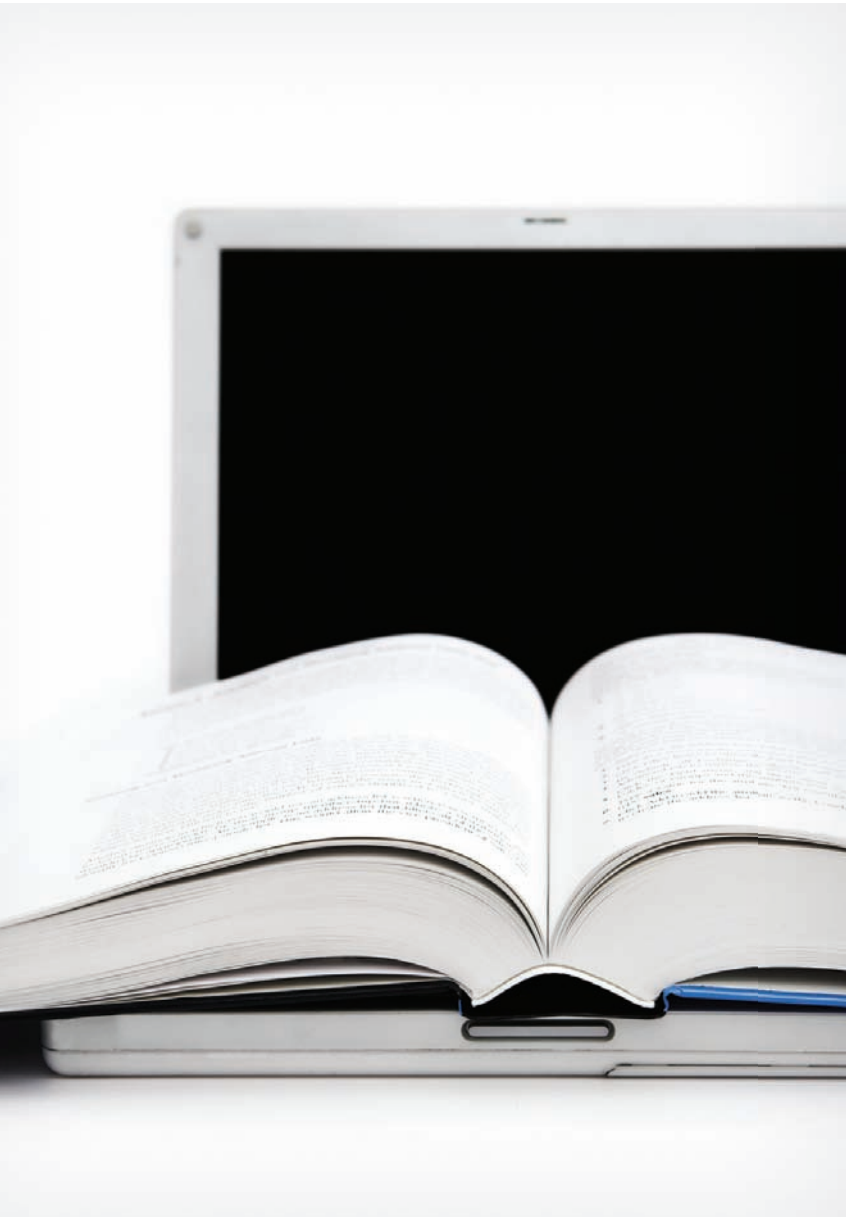
The CMfgT certification primarily benefits new manufacturing engineers and experienced manufacturers without other credentials. Pursuing a CMfgT certification requires a minimum of four years combined manufacturing-related education and/or work experience.

Certified Manufacturing Engineer (CMfgE)

Professionals who earn a CMfgE demonstrate a comprehensive knowledge of manufacturing processes and practices. CMfgE candidates must have a minimum of eight years of combined manufacturing-related education and/or work experience, including a minimum of four years of work experience. A CMfgT with a minimum of seven years manufacturing-related work experience and/or education also qualifies.

Green Workforce Certificate Programs

SME and the Purdue University Technical Assistance Program (TAP) developed the Green Outcome Assessment that candidates can take to obtain the Green Manufacturing Specialist Certificate. The program helps companies and employees integrate green initiatives into their daily work and improve their bottom-line impact on the environment.



CONTENT

Knowledge Edge® features over 1,200 eBooks and individual chapters in downloadable format, over 700 videos and video clips available on demand, more than 16,000 technical papers, and over 10,000 knowledge entries in the Manufacturing Knowledge Base wiki.

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ASSEMBLY/FINAL STAGE PROCESS

- A Guide to High Performance Powder Coating 
- Affordable Automation for Small & Medium Facilities 
- Brazing & Soldering 
- Electrocoat Paint Finishing Defects 
- Fastening & Assembly 
- Finishing Systems Design and Implementation 
- Getting Factory Automation Right (The First Time) 
- Liquid Paint Finishing Defects 
- Managing a Paint Shop 
- Painting & Powder Coating 
- Plating & Surface Coatings 
- Successful Assembly Automation 
- User's Guide to Powder Coating, Fourth Edition 

COMPOSITES PROCESSING

- Automated Composite Layup & Spray Up 
- Composite Materials (thermoset fiber-reinforced composites; thermoplastics) 
- Composite Materials & Manufacturing 
- Composite Tooling Design 
- Composites Post Fabrication & Joining 
- Compression Molding 
- Filament Winding 
- Introduction to Composites Technology 
- Liquid Molding 
- Manual Composite Layup & Spray Up 
- Powder Metallurgy 
- Pultrusion 

ENGINEERING/MANAGEMENT

- ABC/ABM Understanding Manufacturing Costs 
- Benchmarking Manufacturing Processes — Program Reference Guide 
- Concept Modeling 
- Concurrent Engineering Design 
- Continuous Improvement-Sustaining the Effort 
- Controlling Design Variants 
- Design for Manufacture and Assembly 
- DFM: Design for Manufacturing (case studies) 
- Direct Metal Manufacturing 
- Ergonomic Safety (case studies) 
- Ergonomics in Manufacturing 
- Factory Man: How Jim Harbour discovered Toyota's quality and productivity methods and helped the U.S. auto industry get competitive 
- Failure Mode Effects Analysis 
- From Concept to Customer: Portfolio, Pipeline, and Strategic Project Management 
- Gaging & Inspection Tool Design 
- Inspection and Measurement in Manufacturing 
- Kaizen Event Fieldbook 
- Kaizen Event Implementation Manual, 5th Edition 
- Kanban Systems 
- Lean 9001: Battle for the Arctic Rose 
- Lean Manufacturing for the Small Shop, 2nd Edition 
- Lean Manufacturing Systems and Cell Design 
- Lean Manufacturing: A Plant Floor Guide 
- Lean Tooling 
- Machine Vision & Error Proofing 








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 VIDEO ON-DEMAND

ENGINEERING/MANAGEMENT (cont.)

Making Manufacturing Cells Work 
Managing Teams in Manufacturing 
Manufacturing Plant Layout 
Measurement & Gaging 
Mechanical & Non-Destructive Testing 
Medical Applications of Rapid Prototyping 
Passion for Manufacturing 
Precision Machine Design 
Rapid Castings: Rapid Prototypes for Metal Casting Processes 
Rapid Injection Mold Tooling 
Rapid Manufacturing 
Rapid Prototyping 
Rapid Prototyping & Manufacturing 
Rapid Tooling, Rapid Parts 
Realistic Cost Estimating for Manufacturing, 2nd Edition + Instructor's Guide 
Re-Engineering the Manufacturing Enterprise 
Reverse Engineering: 3D Data Capture 
RFID: Tool Tracking Solutions 
Six Sigma and Other Continuous Improvement Tools for the Small Shop 
Stereolithography and Other RP&M Technologies 
Story of a Lean Journey 
Strategic Project Management 
Success Factors for Implementing Change: A Manufacturing Viewpoint 
The Hitchhiker's Guide to Lean 
The Human Side of Lean Manufacturing at TECHNICOLOR 
The Lean Company: Making the Right Choices 
The Power of Small Ideas 

The Squeeze: A Novel Approach to Business Sustainability 
Theory of Constraints 
Training Within Industry 
User's Guide to Rapid Prototyping 
Walking the Talk: Moving into Leadership 
What About Rewards for the Ideas? 
What is an Idea? 

FOUNDATIONAL

A Lean Supply Chain at John Deere 
A Primer on the Taguchi Method, 2nd Edition 
Autonomous Activities - TPM in America Video 5 
Benchmarking Manufacturing Processes: Introspection; Reaching Outward (two-part video series)
Breakthrough Kaizen Events 
Building a Lean Culture 
C-17 Quality 
C-17 Production Operations and Lean Manufacturing 
Continuous Quality Improvement 
Customer Focused Manufacturing 
Employee Involvement: A Key Strategy to Running a Healthy Business 
Engineering a Lean Supply Chain 
Five S Factory Makeover 
Flexible Material Handling 
Flexible Small Lot Production for JIT 
Focusing Ideas on What Matters Most 

FOUNDATIONAL (cont.)









- Fundamentals of Composites Manufacturing, 2nd Edition + Instructor's Guide
- Fundamentals of Manufacturing, 3rd and 2nd Edition
- Fundamentals of Manufacturing Solutions Manual
- Fundamentals of Manufacturing Supplement (to the 2nd edition)
- Fundamentals of Manufacturing Workbook
- Getting More and Better Ideas
- Green Lean: Achieving Outstanding Environmental Performance with Lean
- Incorporating Lean: From the Factory to Front Office
- Introduction to Lean Manufacturing
- Introduction to Lean Tooling
- Lean Accounting
- Lean Automation
- Lean Culture
- Lean ITS
- Lean Manufacturing at Miller SQA
- Lean Manufacturing at TAC Manufacturing
- Lean Manufacturing in a Small Shop
- Lean Product Design
- Lean Six Sigma, the Power to Drive Rapid and Sustained Value Creation
- Lean Tooling in Action
- Leaning the Supply Chain
- Learning Lean Through Simulation
- Lessons from the Field: Making Lean Finally Work
- Liberating and Transforming: Employee Ideas and Lean Culture
- Making Ideas a Central Part of Work
- Manufacturing Processes and Materials, 4th Edition + Instructor's Guide
- Mapping Your Value Stream
- Metal Forming Simulation
- Minimum Quantity Lubrication
- Mistake Proofing: Achieving Zero Defects
- Plastic Blow Molding
- Plastic Injection Molding
- Plastic Injection Molding 1: Manufacturing Process Fundamentals
- Plastic Injection Molding 2: Material Selection and Product Design Fundamentals
- Plastic Injection Molding 3: Mold Design and Construction Fundamentals
- Plastic Injection Molding 4: Manufacturing Startup and Management
- Plastic Injection Molds
- Plastic Thermoforming
- Plastics Finishing
- Poka Yoke: Mistake Proofing
- Preparation & Initial Activities to Implement TPM: TPM in America Video 1
- Preventive & Predictive Maintenance Tools & Techniques: TPM in America Video 3
- Quick Changeover for Lean Manufacturing
- Right-Sized Equipment
- Setup Reduction
- Single Piece Flow

FEATURE KEY









eBOOK

VIDEO ON-DEMAND

FOUNDATIONAL (cont.)

- Six Sigma ◉
- Six Sigma Process Improvement: Program Development in a High Speed Process Environment ◉
- Supplier Development — Boeing JDAM ◉
- Supply Chain Management ◉
- The Challenge of Staying Lean After Initial Application ◉
- The Characteristics of a Good Process ◉
- The Computerized Maintenance Management System - TPM in America Video 4 ◉
- The Cost of Poor Quality ◉
- Threading ◉
- Time to Market: Reducing Product Lead Time 
- Tool and Die Maintenance & Troubleshooting ◉
- Tool Materials ◉
- Total Productive Maintenance Blitz ◉
- TPM in America Reference Guidebook 
- TPM: Total Productive Maintenance ◉
- Training Operators for TPM: TPM in America Video 2 ◉
- Value Stream Mapping ◉
- Visual Controls ◉
- What Lean Means ◉
- Work Measurement ◉
- Working with Acrylic 
- Working with Cellulosic 
- Working with Nylon 
- Working with Polyethylene 
- Working with Polystyrene 
- Working with Vinyl 




MACHINING

- Adaptation of the High Performance Milling Process ◉
- Advanced Grinding ◉
- Basics of Grinding ◉
- Chatter Avoidance for High Performance Machining ◉
- Chip Formation During High Speed Machining of Tempered Steel ◉
- Computer Numerical Control ◉
- Computer-Aided Tooling Design ◉
- Cutting and Grinding Fluids: Selection and Application, 2nd Edition 
- Cutting Tool Design ◉
- Cutting Tool Geometries ◉
- Cutting Tool Materials ◉
- Deburring and Edge Finishing Handbook 
- Deburring Processes ◉
- Electrical Discharge Machining ◉ 
- Fixture Design ◉
- Gears & Gear Manufacturing ◉
- Grinding ◉
- Grinding Technology 
- Hand Deburring Increasing Shop Productivity 
- Handbook of Jig and Fixture Design, 2nd Edition 
- High Speed Holemaking ◉
- High Speed Machining ◉ 
- High Speed Machining: A Workholding Perspective ◉
- Holemaking ◉
- Low-Cost Jigs, Fixtures and Gages for Limited Production + Instructor's Guide 






MACHINING (cont.)

- Managing Computer Numerical Control Operations 
- Metalcutting Fluids 
- MicroMachining 
- Milling & Machining Centers 
- New Developments in High Speed Machining 
- Parametric Programming for CNC Machines 
- Plastics Machining & Assembly 
- Thermal & Abrasive Waterjet Cutting Processes 
- Tooling for High Speed Machining 
- Turning & the Lathe 
- Using Computer Simulation to Understand & Optimize High Speed Machining 
- Workholding 

MAINTENANCE



- Contact Angle & Bearing Selection for High Speed, Grease Lubricated Spindles 
- Gear Hobbing Shaping and Shaving 
- Industrial Robotics 

STAMPING/FORMING/FABRICATING

- Casting 
- Die Casting 
- Die Design Handbook, 3rd Edition 
- Die Maintenance Handbook 
- Extrusion Processes 

- Forging 
- Fundamentals of Hydroforming 
- Fundamentals of Pressworking 
- Fundamentals of Tool Design, 6th and 5th Editions + Instructor's Guides 
- Handbook of Metal Forming 
- Heat Treating 
- Hydroforming 
- Laser Cutting Guide for Manufacturing 
- Press Brake Technology 
- Progressive Die Design 
- Progressive Dies: Principles and Practices 
- Punch Presses 
- Quick Die Change, 2nd Edition 
- Rapid Tooling Design 
- Roll Forming 
- Sheet Metal Coil Processing 
- Sheet Metal Shearing & Bending 
- Sheet Metal Stamping Dies & Processes 
- Sheet Metal Stamping Presses 
- Thermoforming 
- Tool and Die Making Troubleshooter 
- Tube Bending 
- Tube Forming Processes: A Comprehensive Guide 

WELDING

- Advanced Robotic Welding 
- Welding 

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DESIGN AND ENGINEERING SESSIONS

Advanced GD&T sessions
Blueprint Reading sessions
Design for Production and Assembly of Complex Components sessions
GD&T Standard Update session
Introduction to GD&T sessions
Precision Machine Design for Mechatronic Automation sessions
Tolerance Stacks sessions

LEAN SESSIONS

Cell Planning sessions
Five Principles of Lean sessions
Lean Management sessions
Planning Lean Layouts sessions
ABCs of A3s sessions
Value Stream Mapping sessions

MANAGEMENT SESSIONS

Pricing and Estimating sessions
Safety sessions
Strategic Project Management sessions
Economics of Burrs and Deburring sessions

MATERIALS SESSIONS

Advanced Composites Manufacturing: Fiber Reinforced Polymer Materials
Advanced Composites Manufacturing: Manufacturing Processes
Advanced Composites Manufacturing: Tooling

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