

**Program Number 50-439-3**  
**5-Year Contract**

**Work Hours (including related instruction): 10,000**  
**Related Instruction Hours: 576 • Night School Hours: 8**

### ABOUT APPRENTICESHIP

Apprenticeships are employer-sponsored training programs. You must have a contract before being invited to school. A special application process is used for these programs. Please contact the Apprenticeship Office for the proper forms. Apprenticeship means you earn while you learn. If you want a career in a skilled trade, apprenticeship is the best way to get there. You'll combine on-the-job training with on-campus learning—you'll have the best of both worlds when it comes to learning the skills you need to get ahead. And even better, you'll earn a paycheck while you learn those skills.

### ABOUT THE CAREER

Tool and die makers are vital to the metal-working industry because they produce the tools, dies, and special grinding and holding devices used in mass production. The Tool and Die Apprenticeship program is an employer-sponsored, hands-on training program. If you like working with mechanical technology/ manufacturing processes and you value and can work with exacting precision, your talents fit perfectly with a career as a journey-level tool and die maker.

### CAREERS

Graduates of LTC's Tool and Die Apprenticeship program work as journey-level tool and die makers in a variety of manufacturing/industrial settings.

### INDUSTRIAL APPRENTICE ACCEPTANCE REQUIREMENTS

- Determined by employer
- Wisconsin Apprentice Contract

### PROGRAM OUTCOMES

- Apply basic safety practices in the machine shop.
- Interpret industrial/engineering drawings.
- Apply precision measuring methods to part inspection.
- Perform basic machine tool equipment setup and operation.
- Perform programming, setup, and operation of CNC machine tools.
- Design jigs and fixtures.
- Summarize practices to produce dies for a variety of operations.

### APPROXIMATE COSTS

Contact the LTC Apprenticeship office or visit [www.gotoltc.edu/apprenticeship](http://www.gotoltc.edu/apprenticeship) for detailed information.

### SPECIAL NOTE

You must have a sponsoring employer and a contract before attending school.

### CAREER & EDUCATION ADVANCEMENT OPPORTUNITIES

LTC credits transfer to over 30 universities. For more information visit [gotoltc.edu/future-students/transfer](http://gotoltc.edu/future-students/transfer).

*Curriculum and Program Acceptance requirements are subject to change. Program start dates vary; check with the Apprenticeship Office for details. The tuition and fees are approximate based on 2019-2020 rates and are subject to change prior to the start of the academic year.*

Catalog No.	Class Title	Credit(s)
<b>Term 1</b>		
50420714	Engineering Drawings for Machine Trades Apprentice 1	1
50420713	Precision Measurement for Machine Tool Trades	1
<b>2</b>		
<b>Term 2</b>		
50420734	Mathematics for Machinist Apprentice 1	1
50420715	Mechanical Hardware and Hand Tools for Machine Trades Apprentice	0.5
50420720	Materials and Cut-Off Machines for Machine Trades	0.5
<b>2</b>		
<b>Term 3</b>		
50420721	Math for Machine Trades 2	0.5
50420722	Engineering Drawings for Machine Trades 2	0.5
50420718	Drilling Machines for Machine Trades Apprentice	0.5
50420717	Milling Machines for Machine Trades Apprentice	0.5
<b>2</b>		
<b>Term 4</b>		
50420724	CNC Programming and Planning for Machine Trades	1
50420716	Turning Machines for Machine Trades Apprentice	0.5
50420723	Intro to CAM for Machine Trades Apprentice	0.5
<b>2</b>		
<b>Term 5</b>		
50420725	Basic CAD/CAM for Machine Trades Apprentice	1
50420726	Jig and Fixture Design for Machine Trades Apprentice	0.5
50420719	Grinding Machines for Machine Trades Apprentice	0.5
<b>2</b>		
<b>Term 6</b>		
50420733	CNC Operations for Machine Tool Trades Apprentice	1
50420727	Geometric Design and Tolerancing for Machine Trades	0.5
50420731	Metallurgy for Machine Trades Apprentice	0.5
<b>2</b>		
<b>Term 7</b>		
50420732	Electrical Discharge Machining for Machine Trades	1
50420728	Basic Stamping Die-making for Machine Trades	1
<b>2</b>		
<b>Term 8</b>		
50420730	Stamping Die Design Applications for Machine Trades Apprentice	1
50420729	Mold Making for Machine Trades Apprentices	1
<b>2</b>		

**TOTAL 16**



**BASIC CAD/CAM FOR MACHINE TRADES APPRENTICE**...is designed to provide concepts and techniques used in computer-aided design (CAD) and computer-aided manufacturing (CAM) as part of their related instruction. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Requirements Met

**BASIC STAMPING DIEMAKING FOR MACHINE TRADES**...introduces the basics of stamping diemaking. Topics include basic terminology, blanking, piercing, bending and related basic operations. In addition, learners will discover the basics of the theory and background knowledge related to stamping diemaking. CONDITION: 504393 Tool and Die Apprentice Program Requirements Met

**CNC OPERATIONS FOR MACHINE TOOL TRADES APPRENTICE**...will examine CNC related operations and safety. Course competencies include classifying types of equipment, comparing CNC tooling, setup, and work holding operations. Additional CNC programming skill development is included in the course. CNC controls and communications are explored as well. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Requirements Met

**CNC PROGRAMMING AND PLANNING FOR MACHINE TRADES**...is a classroom introduction to CNC programming for apprentices, with a focus on CNC turning and milling centers. Apprentices will create set up sheets, develop tool lists, calculate speeds and feeds, assign tool offsets and write CNC program. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Reqs Met

**DRILLING MACHINES FOR MACHINE TRADES APPRENTICE**...focuses on safety, terminology, construction and operations of drilling machines in the metal-working industry. CONDITION: 504393 Tool & Die Appr or 504202 Machinist Appr Prog Reqs Met

**ELECTRICAL DISCHARGE MACHINING FOR MACHINE**...is designed to give a basic understanding of the theory and process of sinker and wire EDM in toolmaking. This course uses the EDM Technical Manual distributed by POCO Graphite, Inc., which contains the most current information available in industry. CONDITION: 504393 Tool and Die Apprentice Program Requirements Met

**ENGINEERING DRAWINGS FOR MACHINE TRADES APPRENTICE 1**... will acquaint the apprentice with the interpretation of engineering prints and other technical and manufacturing documentation. The primary focus of the course will be on that part of manufacturing most closely related to machining and tooling. Background information is provided relative to the process used to create and finish the product or piece part on the prints being studied. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Requirements Met

**ENGINEERING DRAWINGS FOR MACHINE TRADES 2**...prepares the learner to interpret manufacturing prints to extract detailed information about threads, sections, auxiliary views, fasteners, surface finishes, welding symbols, assembly, geometric location, and tolerances. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Requirements Met

**GEOMETRIC DESIGN AND TOLERANCING FOR MACHINE TRADES**... will acquaint the apprentice with the skills to interpret the geometric dimensions and tolerances found on engineering drawings and in other industrial documents. Instruction concentrates on interpreting the symbols, identifying tolerance zones and determining ways to check parts for conformity to the specified geometric controls. Reference is made to ASME Y14.5M - 1994. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Requirements Met

**GRINDING MACHINES FOR MACHINE TRADES APPRENTICE**...focuses on the safety, terminology, construction, and operation of grinding machines in the metal working industry. It instructs apprentices in the use of traditional grinding machines and the attachments and accessories frequently encountered in manufacturing operations that use the common grinding processes. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Requirements Met

**INTRO TO CAM FOR MACHINE TOOLS TRADES APPRENTICE**...is widely used in industry for creating G&M code programs for CNC machines. In this course the learner will explore the Mastercam interface. You will be determining the proper post processors for the work being done. Create and edit basic geometry. Create and edit tool paths for basic operations. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Requirements Met

**JIG AND FIXTURE DESIGN FOR MACHINE TRADE APPRENTICE**... introduces the apprentice to the concepts of jig and fixture design as part of their apprentice related instruction. Topics include the basic elements of tool design, jig and fixture application, and the actual design of tooling. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Requirements Met

**MATERIALS AND CUTOFF MACHINES FOR MACHINE TRADES**...prepares the learner to identify metal composition and classification, follow cutoff machine tool safety rules, operate horizontal cutoff machine tools, and operate vertical machine tools. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Requirements Met

**MATH FOR MACHINE TRADES 2**...prepares the learner to interpret symbols used in algebraic expressions, solve equations by the rearrangement of formulas, use formulas, solve unknown angles using angular principles, and solve for the angles and length of sides in right triangles. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Requirements Met

**MATHEMATICS FOR MACHINIST APPRENTICE 1**...provides applied mathematics instruction from a review of basic arithmetic; basic algebra; applications based on geometry; right triangle trigonometry and oblique angle trigonometry; and compound angles. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice program requirements met

**MECHANICAL HARDWARE & HAND TOOLS FOR MACHINE TRADES APPRENTICE**... provides instruction for the apprentice in the recognition, selection, and operation of mechanical hardware and hand tools. Apprentices are taught to use outside sources to select correct component or tool sizes, characteristics, and operating parameters. Apprentices will sharpen drills and single point cutting tools. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Requirements Met

**METALLURGY FOR MACHINE TRADES APPRENTICES**...prepares the learner to interpret the properties of ferrous and non-ferrous materials as well as how to heat treat and test the hardness of ferrous materials. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Requirements Met

**MILLING MACHINES FOR MACHINE TRADES APPRENTICE**...will instruct apprentices on the basic principles of vertical and horizontal milling machines for the machine tool trade. Instruction includes safety, basic parts and functions of the machines, work holding devices, tooling requirements, and feeds and speeds. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Requirements Met

**MOLD MAKING FOR MACHINE TRADES APPRENTICES**...introduces the apprentice to the basic mold die making process consisting of mold construction, components, and materials. CONDITION: 504393 Tool and Die Apprentice Program Requirements Met

**PRECISION MEASUREMENT FOR MACHINE TOOL TRADES**...is designed to acquaint the apprentice with the measurement systems and tools most frequently used in layout and machining processes. Learning outcomes relate to semi-precision through super-precision measuring tools and equipment combined with opportunities to investigate new technologies. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Requirements Met

**STAMPING DIE DESIGN APPLICATIONS FOR MACHINE TRADES APPRENTICE**... provides the stamping die maker apprentice with the opportunity to design from part specifications two elementary stamping dies. This course provides instruction for the tool and die, stamping die and mold makers apprenticeship. CONDITION: 504393 Tool and Die Apprentice Program Requirements Met

**TURNING MACHINES FOR MACHINE TRADES APPRENTICE**...will acquaint the apprentice with the terminology, methods, and operations for turning machines used in the metal-working industry. Apprentices will learn to perform calculations needed to operate turning machines including speed and feed calculations. Apprentices will make calculations necessary to setup a turning machine for screw threads and taper operations. CONDITION: 504393 Tool and Die Apprentice or 504202 Machinist Apprentice Program Requirements Met