

## Program Number 31-420-1 Technical Diploma • Two Terms

### ABOUT THE PROGRAM

Just about every product that you use in your daily activities is the result of a machine tool manufacturing process. If you like hands-on work, are detail-oriented, have good math skills, and are able to develop and follow through on work instructions, a career in machine tool operation offers you lifelong opportunities.

### 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.

### CAREER AND 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).

### ADMISSION TO DO'S

- Work with Career Coach to:
  - Submit application and \$30 fee.
  - Submit official transcripts (high school and other colleges).

### PROGRAM TO DO'S

- Work with Academic Advisor to:
  - Complete Functional Abilities Statement of Understanding form.
  - Meet to plan your first semester schedule, review your entire plan of study, and complete Program To Do's.

### APPROXIMATE COSTS

- \$136.50 per credit tuition (WI resident) plus \$7.38 per credit student activity fee. \$10 per credit online fee. Material fee varies depending on course. Other fees vary by program. Visit [gotoltc.edu/financial-aid/tuition-and-fees](http://gotoltc.edu/financial-aid/tuition-and-fees) for details.

### FINANCIAL AID

This program is eligible for financial aid. Visit [gotoltc.edu/Financial-Aid](http://gotoltc.edu/Financial-Aid) or talk with your Career Coach about how to apply for aid.

### RELATED PROGRAMS

- CNC Technician Technical Diploma
- Machinist Apprenticeship
- Tool & Die Apprenticeship

### CONTACT

LTC Career Coach  
920.693.1162 • [CareerCoach@gotoltc.edu](mailto:CareerCoach@gotoltc.edu)

Catalog No.	Class Title	Credit(s)
<b>Term 1</b>		
31420310	Machine Tool Hand Tools	1
31420330	Machine Tool Measuring	1
31420336	Machine Tool Drills	1
31420334	Machine Tool Saws/Material Selection	1
31420340	Machine Tool Lathes 1A	1
31420341	Machine Tool Lathes 1B	1
31420350	Machine Tool Mills 1A	1
31420351	Machine Tool Mills 1B	1
31420311	Machine Tool Programming Basic	1
31420325	Machine Tool Math Basic	1
31420326	Machine Tool Math Intermediate	1
31420385	Machine Tool Print Reading 1	1
31420386	Machine Tool Print Reading 2	1
		<b>13</b>
<b>Term 2</b>		
31420313	Machine Tool Programming	1
31420315	CAM for Milling Machines	1
31420342	Machine Tool Lathes 2	1
31420352	Machine Tool Mills 2	2
31420308	Intro to CNC Turning Center	1
31420307	Intro to CNC Machining Center	1
31420380	Machine Tool CNC Turning Center	2
31420382	Machine Tool CNC Machining Center	2
31420398	Machine Tool Technical Skills Portfolio	1
31809362	Psychology for Life	1
31801359	Communication Skills for the Workplace	2
		<b>15</b>
		<b>TOTAL 28</b>

*Curriculum and Program Acceptance requirements are subject to change. Program start dates vary; check with your advisor 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.*



**CAM FOR MILLING MACHINES**...provides the learner with skills to: explore "Mastercam" computer software environment, construct 2-D geometry, modify existing geometry, create 2-D toolpaths for hole producing, profiling and pocketing, modify toolpaths using operations manager, transform existing toolpaths and create CNC Machine Operator documents. COREQUISITE: 31420352 Machine Tool Mills 2

**COMMUNICATION SKILLS FOR THE WORKPLACE**...prepares the student to develop paper job-search tools and job-related writing skills to increase job stability; introduces the students to team-building skills to resolve organizational problems; introduces the student to the skills of effective listening; prepares the student to respond to workplace criticism and praise; and introduces the student to interpersonal relationship skills, including effective interviewing skills, customer relations, and management/employee relations.

**INTRO TO CNC MACHINING CENTER**...prepares the learner to follow Computer Numerical Control (CNC) machining center machine tool safety rules, identify components, apply coordinate systems, load programs into the machining center, load cutting tools, enter offsets for tools and workpiece, and operate a CNC machining center. PREREQUISITE: 31420340 Machine Tool Lathes 1A or 10420103 Machine Tool Lathes 1A or 31420395 Ind MtnC Machine Tool Lathes and Mills

**INTRO TO CNC TURNING CENTER**...prepares the learner to follow Computer Numerical Control (CNC) turning center safety rules, apply coordinate systems, identify CNC turning center components and tooling; load programs into the CNC turning center, load cutting tools, enter offsets for tools and workpiece, and operate a CNC turning center. PREREQUISITES: 31420340 Machine Tool Lathes 1A or 10420103 Machine Tool Lathes 1A or 31420395 Ind MtnC Machine Tool Lathes and Mills

**MACHINE TOOL CNC MACHINING CENTER**...prepares the learner to follow Computer Numerical Control (CNC) machining center safety rules, apply coordinate systems, identify components and tooling, and set up and operate a CNC machining center with Haas controls. COREQUISITE: 31420307 Intro to CNC Machining Center

**MACHINE TOOL CNC TURNING CENTER**...prepares the learner to follow Computer Numerical Control (CNC) turning center safety rules, apply coordinate systems, identify CNC turning center components and tooling, and set up and operate a CNC turning center with Haas controls. COREQUISITE: 31420308 Intro to CNC Turning Center

**MACHINE TOOL DRILLS**...prepares the learner to interpret the attributes of hole-producing tools, follow drilling machine tool safety rules, identify drilling machine tool components, and operate sensitive drilling machine tools. COREQUISITE: 31420310 Machine Tool Hand Tools or 31420394 Ind MtnC Machine Tool Intro or 10420194 Machine Tool Introduction

**MACHINE TOOL HAND TOOLS**...prepares the learner to identify and use tools required during the machining and assembly process including precision, semi-precision measuring tools, layout, surface finish, and mechanical hand tools, power hand tools, and a variety of fastener types. COREQUISITE: 31420330 Machine Tool Measuring

**MACHINE TOOL LATHES 1A**...introduces the student to the characteristics and attributes of turning tools: follow engine lathe safety rules, identify engine lathe components, perform facing and center drilling operations, perform turning operations. COREQUISITE: 31420310 Machine Tool Hand Tools or 31420394 Ind MtnC Machine Tool Introduction or 10420194 Machine Tool Introduction

**MACHINE TOOL LATHES 1B**...prepares the learner to perform turning operations using various workholding devices, includes universal jaw chuck and spring collet chuck. Perform turning operations using radius cutting tools, chamfering tools, and grooving tools. COREQUISITE: 31420340 Machine Tool Lathes 1A or 10420103 Machine Tool Lathes 1A or 31420349 Machine Tool Lathes 1 for Fabricators or 31420395 IM MT Lathes and Mills

**MACHINE TOOL LATHES 2**...prepares the learner to perform hole producing, cutoff, and threading operations on a manual lathe. COREQUISITE: 31420341 Machine Tool Lathes 1B

**MACHINE TOOL MATH-BASIC**...prepares the learner to use scientific calculators for the applications of common fraction and mixed number problems, decimal problems, inch and metric conversion problems, basic percentage problems, powers and roots, and pre-algebra problems. This course is self-paced when delivered in the evening.

**MACHINE TOOL MATH-INTERMEDIATE**...prepares the learner with the necessary skills to use scientific calculators for the application of algebra, geometry, and trigonometry. This advanced course when delivered in the evening is self-paced, open-entry/exit, and designed for individualized student needs. COREQUISITE: 31420325 or 31420320MB Machine Tool Math-Basic

**MACHINE TOOL MEASURING**...prepares the learner to use semi-precision measuring instruments and measurement techniques, use precision measuring instruments and measurement techniques, and use a surface plate as a basis for precision measurements.

**MACHINE TOOL MILLS 1A**...prepares the learner to identify vertical milling machine components, select cutting tools and workholding device(s), apply safety rules, set up the vertical milling machine, and mill square surfaces. COREQUISITE: 31420310 Machine Tool Hand Tools or 31420394 Ind MtnC Machine Tool Intro or 10420194 Machine Tool Intro

**MACHINE TOOL MILLS 1B**...prepares the learner to mill precision steps and slots, mill keyseats on a shaft, and machine holes in rectangular workpieces. COREQUISITE: 31420350 Machine Tool Mills 1A or 10420105 Machine Tool Mills 1A or 31420395 IM MT Lathes and Mills or 31420348 Machine Tool Mills 1 for Fabricators

**MACHINE TOOL MILLS 2**...prepares the learner to select cutting tools, set up, program and operate Proto-Trak vertical mills. Operations to include: face mill, mill slots, pockets, angles and position drill and program. COREQUISITE: 31420351 Machine Tool Mills 1B

**MACHINE TOOL PRINT READING 1**...prepares the learner to read prints; make isometric sketches; interpret orthographic projection drawings, to include sections, surface finishes, and tolerancing. The course when delivered in the evening is self-paced, open-entry/exit, and designed for individualized student needs.

**MACHINE TOOL PRINT READING 2**...prepares the learner to read prints; make isometric sketches; interpret orthographic projection drawings to include sections, auxiliary views, threads, fasteners, surface finishes, geometric dimensions, tolerancing, and assembly prints. The course when delivered in the evening is self-paced, open-entry/exit, and designed for individualized student needs. COREQUISITE: 31420385 or 31457385P1 Machine Tool Print Reading 1

**MACHINE TOOL PROGRAMMING**...prepares the learner to interpret positions in coordinate systems, prepare a sequence of machining operations, use G&M programming codes, and prepare G&M part programs for machining centers and turning centers. A basic understanding of the tools used on Lathes is necessary to be successful in this class. COREQUISITE: 31420311 Machine Tool Programming Basic

**MACHINE TOOL PROGRAMMING BASIC**...will have the learner demonstrate an understanding of Computer Numerical Control (CNC) systems used on machine tools, prepares the learner to interpret positions in the coordinate system, prepare a cutting tool list; prepare a machining process list, identify and use common G&M codes, and prepare G&M part programs for machining centers. A basic understanding of cutters used on the Mills is necessary to be successful in this class.

**MACHINE TOOL SAWS AND MATERIAL SELECTION**...prepares the learner to identify metal composition and classification, follow cutoff machine tool safety rules, operate horizontal cutoff machine tools, and operate vertical cut off machine tools. COREQUISITE: 31420310 Machine Tool Hand Tools or 31420394 Ind MtnC Machine Tool Introduction or 10420194 Machine Tool Introduction

**MACHINE TOOL TECHNICAL SKILLS PORTFOLIO**...prepares the learner to create a capstone project using multiple machines and setups, create a portfolio showing skills attained throughout Machine Tool courses, resume, and grade sheet for all Machine Tool courses. COREQUISITES: 31420342 Machine Tool Lathes 2 and 31420352 Machine Tool Mills 2

**PSYCHOLOGY FOR LIFE**...prepares the learner to select behavior modification techniques, demonstrate techniques for enhancing memory, analyze expressions of emotion, use conflict for common good, employ techniques to reduce conflict/frustration, use several methods to reduce stress, interpret personality types, ascertain contributors to perception, and apply methods of problem-solving.