

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 machine tool safety practices.
- Develop critical thinking and problem-solving skills.
- Develop and follow manufacturing processes and procedures.
- Set up and operate manual and CNC metal-cutting machine tools in an efficient manner.
- Perform an inspection using hand-held and computerized precision measuring instruments.
- Apply basic math, algebra, geometry, and trigonometry concepts to machining operations.
- Apply print reading skills to machining operations.

ADMISSIONS STEPS

- Work with Admissions Specialist to:
 - Submit application and \$30 fee.
 - Complete an assessment for placement (Accuplacer or ACT).
 - Submit official transcripts (high school and other colleges).
- Meet with program advisor/counselor to discuss program details.

APPROXIMATE COSTS

- \$132 per credit (resident)
- \$198 per credit (out-of-state resident)
- Other fees vary by program (books, supplies, materials, tools, uniforms, health-related exams, etc.) Visit gotoltc.edu/financial-aid/tuition-and-fees for details.

PLACEMENT SCORES

Accuplacer/ACT scores will be used to develop your educational plan. Contact your program advisor/counselor for details.

CAREER AND EDUCATION ADVANCEMENT OPPORTUNITIES

LTC credits transfer to over 30 universities. For more information visit gotoltc.edu/future-students/transfer.

RELATED PROGRAMS

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

CONTACT

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Catalog No.	Class Title	Credit(s)
Term 1		
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 1	2
31420350	Machine Tool Mills 1	2
10420185	Machine Tool Programming Basic	1
31420320	Machine Tool Math	2
31457385	Machine Tool Print Reading	2
31809362	Psychology for Life	1
		14

Term 2		
10420184	Machine Tool Programming	1
10420120	Machine Tool CAM	1
31420342	Machine Tool Lathes 2	2
31420352	Machine Tool Mills 2	2
31420360	Machine Tool Grinders 1	1
31420380	Machine Tool CNC Turning Center	2
31420382	Machine Tool CNC Machining Center	2
31420398	Machine Tool Technical Skills Portfolio	1
31801359	Communication Skills for the Workplace	2
		14

TOTAL 28

Curriculum and Program Acceptance requirements are subject to change. Program start dates vary; check with your advisor/counselor for details.



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.

MACHINE TOOL CAM...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.

MACHINE TOOL CNC MACHINING CENTER...prepares the learner to follow Computer Numerical Control (CNC) machining center tool safety rules, identify components, set up and operate a CNC machining center machine tool with Fanuc controls. COREQUISITE: 31420310 Machine Tool Hand Tools and 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement or 31420394 Industrial Maintenance Measurement and Drills

MACHINE TOOL CNC TURNING CENTER...prepares the learner to follow CNC turning center safety rules, identify CNC turning center components, apply coordinate systems, use manual data input and direct keyboard commands on a control, set up a CNC turning center, and operate a CNC turning center. COREQUISITE: 31420310 Machine Tool Hand Tools and 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement or 31420394 Industrial Maintenance Measurement and Drills

MACHINE TOOL DRILLS...prepares the learner to follow drilling machine tool safety rules, identify drilling machine tool components, and operate sensitive drilling machine tools and radial drilling machine tools. COREQUISITE: 31420310 Machine Tool Hand Tools and 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement

MACHINE TOOL GRINDERS 1...prepares the learner to follow grinding machine tool safety rules, identify grinding machine tool components, grinding wheels, and operate horizontal spindle reciprocating table surface grinders. COREQUISITE: 31420310 Machine Tool Hand Tools and 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement and 31420350 Machine Tool Mills 1 and 31420352 Machine Tool Mills 2

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. COREQUISITES: 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement

MACHINE TOOL LATHES 1...prepares the student to identify 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, perform lathe operations using collets and perform radius and profile operations. COREQUISITE: 31420310 Machine Hand Tools and 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement

MACHINE TOOL LATHES 2...prepares the learner to perform hole producing operation in a lathe, perform cutoff operations, perform threading operations and perform turning operations using soft jaws. COREQUISITE: 31420340 Machine Tool Lathes 1

MACHINE TOOL MATH...prepares the learner to solve common fraction and mixed number problems, solve decimal fractions problems, solve powers and root problems, solve basic percentage programs, convert inch and metric units, interpret symbols used in algebraic expressions, solve equations by the rearrangement of formulas, using formulas, solve unknown angles using angular principles, and solve for the angles and length of sides in a right triangle.

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 1...provides the learner with the skills to: Apply safety rules, Identify machine components, Select cutting tools, Set up the milling machine for work, mill square surfaces, mill precision steps and slots, mill keyseats on a shaft, and machine holes on rectangular parts. COREQUISITE: 31420310 Machine Tool Hand Tools and 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement

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, pickets, angles and position drill and program and operate the Proto-Trak using the DXF converter. COREQUISITE: 31420350 Machine Tool Mills 1 or successful completion of the Mills hands-on exam

MACHINE TOOL PRINT READING...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.

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. PREREQUISITE: 10420185 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.

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 and 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement

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 31420350 Machine Tool Mills 1 and 10420120 Machine Tool CAM

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.