LTC LAKESHORE TECHNICAL COLLEGE

CNC TECHNICIAN

Program Number 32-444-1
Technical DIploma • Four Terms

ABOUT THE PROGRAM

The world of manufacturing is changing rapidly and so too are the skill sets needed to be a competitive part of it. Here is where the skills of a true craftsperson and the high-tech world of automation combine to form the fast-paced CNC programming and machining jobs of the future. If you like to create things with your hands, are fascinated with technology, and want above-average earning power, the CNC Technician program is for you. This career offers the best of both worlds as you will be a respected craftsperson in a growing profession.

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 art inspection using hand-held and computerized precision measuring instruments.
- Develop programming for use on CNC machines.
- Apply advanced math, algebra, geometry, and trigonometry concepts to machining operations.
- Apply advanced 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

- Machinist Apprenticeship
- Tool and 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
	Term 3	
31420372	Metallurgy	1
32444301	Machine Tool Math Advanced	1
32457389	Print Reading Advanced	1
32444305	Advanced Measuring GD&T	2
32444304	Advanced Mills (Proto Traks)	2
32444309	Grinders 2	2
32444302	Advanced Machining Centers 1A	2
32444307	Advanced Turning Centers 1A	2
31809363	Challenging Issues	1
		14
	Term 4	
32444303	Advanced Machining Centers 1B	3
32444308	Advanced Turning Centers 1B	3
32444340	EDM Sinker	2
32444342	EDM Wire	2
32444306	Advanced Technical Skills Portfolio	1
32444343	CNC Technician Internship	2
		13
		TOTAL 55

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

The Hire in HIGHER EDUCATION

ADVANCED MACHINING CENTERS 1...prepares the learner to set up and operate a CNC machining center, perform probing on the CNC machining center, set up and operate using various workholding techniques, editing a program on the CNC control, create single operation programs for the CNC machining center. PREREQUISITE: 31420382 Machine Tool CNC Machining Centers

ADVANCED MACHINING CENTERS 1B…prepares the learner to: create programs using Mastercam software, post process Mastercam program and down load into control, set up and prove out program on CNC machine, operate program on CNC machine, create programs using G&M codes, load program into control, setup and prove out program, and operate program on CNC machining center. PREREQUISITE: 32444302 Advanced Machining Centers 1A

ADVANCED MEASURING/GD&T…prepares the learner to inspect using the following: precision measuring tools, surface plate measuring tools, GD&T form tolerances, GD&T orientation tolerances, GD&T profile and runout tolerances, and GD&T location tolerances, and examine basic CMM programming principles. PREREQUISITE: 31420330 Machine Tool Measuring

ADVANCED MILLS (PROTO TRAKS)…prepares the learner to: setup and operate vertical mills, create and use soft jaws, use advanced subroutine functions, create programs using the A.G.E. function, create programs using the DXF converter. PREREQUISITE: 31420352 Machine Tool Mills 2

ADVANCED TECHNICAL SKILLS PORTFOLIO…prepares the learner to complete a final project using multiple machines, processes, and the advanced skills and techniques acquired throughout the Machine Tool program. Learners will also create a portfolio for this final project that will include a work process plan, and photographs of their project. PREREQUISITE: 31420398 Machine Tool Technical Skills

ADVANCED TURNING CENTERS 1A...prepares the learner to set up and operate a CNC turning center, crate programs for the turning center, execute programs, edit existing G&M code programs on the control, create G&M code programs using conversational programming. PREREQUISITE: 31420380 Machine Tool CNC Turning Centers and 10420184 Machine Tool Programming and 10420120 Machine Tool CAM

ADVANCED TURNING CENTERS 1B...prepares the learner to set up and operate a CNC turning center, create programs for the turning center, execute programs, edit existing G&M code programs on the control, create G&M code programs using conversational programming, create programs using MasterCam. PREREQUISITE: 32444307 Advanced Turning Centers 1A

CHALLENGING ISSUES...prepares the learner to understand the challenging occupational and social issues and problems that shape the direction of today's work world and become aware of what those contemporary issues are, how the issues impact the student, and how the student can make changes when necessary.

CNC TECHNICIAN PROGRAM INTERNSHIP…provides a broad variety of specific occupational experiences in the manufacturing machine tool/CNC machining industry. Students work with faculty to develop an internship plan and identify, coordinate, and evaluate learning experiences appropriate to the field of study and major career focus of the student. COREQUISITES: 32444303 Advanced Machining Centers 1B and 32444308 Advanced Turning Centers 1B and 32444306 Advanced Technician Skills Portfolio and CONDITION: 324441 CNC Technician program requirements met

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.

EDM SINKER...prepares the student to analyze basic Electrical Discharge Machining (EDM) theory, select electrode material, fabricate an electrode, follow sinker EDM safety rules, categorize EDM machine components, set up a sinker EDM, operate a sinker EDM, and create a hand-finished surface. COREQUISITES: 31420310 Machine Tool Hand Tools and 31420330 Machine Tool Measuring or 31420390 Industrial Maintenance Measurement and 31420352 Machine Tool Mills 2

EDM WIRE...prepares the learner to analyze wire EDM processes, identify wire EDM components, follow wire EDM safety rules, set up wire EDM machine tools, operate wire EDM machine tool, hand-finish wire EDM surfaces, manual programming wire EDM machine tools & programming wire EDM machine tools using Master CAM Wire. PREREQUISITE: 32444340 EDM Sinker

GRINDERS 2…prepares the learner to identify grinding-wheel characteristics suitable for various applications, perform the basic process of mounting and dressing contour surface grinding wheels, demonstrate the use of common workholding devices, apply methods for grinding angles, side grinding, and cylindrical grinding. PREREQUISITE: 31420360 Machine Tool Grinders 1

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 MATH ADVANCED...prepares the learner to solve spur gear dimensions using formulas, solve for chord, circumference, and radius by using geometric principles, solve complex practical machine application problems, and solve oblique triangles. PREREQUISITE: 31457320 Machine Tool Math

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

METALLURGY...prepares the learner to interpret the properties of ferrous materials, heat treat ferrous material, test the hardness of ferrous materials, and interpret the properties of non-ferrous materials.

PRINT READING ADVANCED...enhances the learner's ability to interpret complex part drawings answering questions specifically related to: projection type and violations of true projection, positional dimensioning, geometric dimensioning and tolerancing, screw thread types and threaded fasteners, workpiece material types and structural shapes, pin fasteners, springs, and worm gears. The course is self-paced and designed for individualized student needs. PREREQUISITE: 31457385 Machine Tool Print Reading

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.

TTY 711 Lakeshore Technical College does not discriminate on the basis of race, color, national origin, sex, disability or age in employment, admissions or its programs or activities.
The Chief Human Resources Officer has been designated to handle inquiries regarding the College's nondiscrimination policies.