PRECISION MACHINING TECHNOLOGY

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

ABOUT THE PROGRAM

Learn Machining and Computer Numerical Control (CNC) at your own pace, through hands-on learning. 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, 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 set-up and operation
- Perform programming, set-up and operation of CNC Machine Tools.

CAREER AND EDUCATION ADVANCEMENT OPPORTUNITIES

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

ADMISSIONS AND FIRST SEMESTER ENROLLMENT STEPS

- Submit online application.
- Complete the online Student Success Questionnaire.
- Complete Get Started at Lakeshore appointment:
    - Application Check-in
    - College Orientation Overview
    - 1st Time Program Registration

**Submit high school transcripts, college transcripts, and test scores (optional, highly recommended). Official transcripts will be needed for transferring college credit(s) and for financial aid purposes.*

ACADEMIC PREPAREDNESS/FUTURE SEMESTER ENROLLMENT STEPS

If applicable, complete program-specific academic preparedness requirements and enrollment steps prior to enrolling in occupational or core courses. Students will be notified if there is a program waitlist. View the college's program webpage for details: https://lakeshore.edu/programs-and-courses/career-areas/manufacturing/precision-machining-technology.

APPROXIMATE COSTS

$152.85 per credit tuition (WI resident) plus $9.17 per credit student activity fee. Material fee varies depending on course. Other fees vary by program. Visit lakeshore.edu/Financial-Aid/tuition-and-fees for details.

FINANCIAL AID

This program is eligible for financial aid. Visit lakeshore.edu/Financial-Aid for more information.

SPECIAL NOTE

- Learn when you want. Progress at your own pace. Receive personalized coaching and support. The full CBE definition may be found at lakeshore.edu/cbe.
- This program offers flexible start dates throughout the year.

RELATED PROGRAMS

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

CONTACT

Lakeshore College Recruiter
920.693.1366 • Recruitment@lakeshore.edu

Catalog No.	Class Title	Credit(s)
	Term 1	
31442350	Metal Manufacturing Processes*	1
31420330	Precision Measuring*	1
31420385	Orthographic Projection Print*	1
31420325	Manufacturing Math*	1
31420338	Drills and Saws*	1
31420340	Manual Lathe Operation*	1
31420350	Manual Mill Operation*	1
31420386	GD&T Intro*	1
31420326	Manufacturing Applied Math*	1
31444301	G&M Code Programming*	1
31444303	CNC Machining Operation*	1
31444309	CNC Turning Operation*	1
31420359	Heat Treat and Precision Grinding*	1
		13
	Term 2	
31801361	Interpersonal Skills	1
31801360	Workplace Fundamentals	1
31444307	Mill-2D Using CAM*	1
31420353	ProtoTrak Mill-Squaring Programming*	1
31420354	ProtoTrak Mill-Slot and Hole Programming*	1
31444311	CNC Turning-Turning and Cut Off Setup*	1
31444313	CNC Turning-Hole Producing Setup/ Threading*	1
31444315	CNC Machining-Facing and End Milling Setup*	1
31444317	CNC Machining-Hole/Slot/Engraving Setup*	1
31444321	CNC Turning 2D Using CAM*	1
31420361	Complex Print Drawings*	1
31420362	Advanced Precision Measuring*	1
31420363	GD&T-Inspection *	1
		13

TOTAL 26

*CBE delivery only

Curriculum and program acceptance requirements are subject to change. Program start dates vary; check with your academic counselor for details. The tuition and fees are approximate based on 2025-2026 rates and are subject to change prior to the start of the academic year.

LAKESHORE COLLEGE

ADVANCED PRECISION MEASURING…prepares the learner to inspect using the following: precision measuring tools, surface finish 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 and operation principles.

CNC MACHINING OPERATION…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.

CNC MACHINING-FACING AND END MILLING SETUP…prepares the learner to follow Computer Numerical Control (CNC) machining center safety rules, apply coordinate systems, identify components and tooling, and setup and operate a CNC machining center.

CNC MACHINING-HOLE/SLOT/ENGRAVING SETUP…prepares the learner to apply additional tooling and setup and operation techniques to the CNC machining center including, end-milling tools to obtain size, drilling, tapping and engraving tooling.

CNC TURNING 2D USING CAM...provides the learner with skills to construct and modify geometry, create toolpaths for CNC turning operations and develop operator documents using Computer Aided Manufacturing software (CAM).

CNC TURNING OPERATION…prepares the learner to follow Computer Numerical Control (CNC) turning 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 turning center.

CNC TURNING-HOLE PRODUCING SETUP/THREADING…prepares the learner to apply additional tooling and setup and operation techniques to the CNC turning center including drilling, tapping and internal boring.

CNC TURNING-TURNING AND CUT OFF SETUP…prepares the learner to apply additional tooling and setup and operation techniques to the CNC turning center including drilling, tapping and internal boring.

COMPLEX PRINT DRAWINGS...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. COREQUISITE: 31420386 GD&T Intro

DRILLS AND SAWS…prepares the learner to interpret the attributes of hole-producing tools, follow drilling machine safety rules, identify components, operate sensitive drilling machine, identify metal composition and classification, follow cutoff safety rules, operate horizontal and vertical cutoff machines.

G&M CODE PROGRAMMING...will have the learner demonstrate an understanding of Computer Numerical Control (CNC) systems, 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.

GD&T INSPECTION…prepares the learner to inspect Geometric Dimensioning and Tolerancing (GD&T) part features. This course also introduces the student to the latest measuring technology including Coordinate Measuring Machine (CMM) and 3D scanning.

GD&T INTRO...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. COREQUISITE: 31420385 Orthographic Projection Print

HEAT TREAT AND PRECISION GRINDING...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.

INTERPERSONAL SKILLS…prepares the learner to model interpersonal skills, ethics and diversity.

MANUAL LATHE OPERATION…prepares the learner to perform lathe facing, turning, hole producing and threading operations safely.

MANUAL MILL OPERATION…prepares the learner to perform squaring, slot milling and hole producing using a vertical mill machine safely.

MANUFACTURING APPLIED MATH...prepares the learner with the necessary skills to use scientific calculators for the application of algebra, geometry, and trigonometry. COREQUISITE: 31420325 Manufacturing Math

MANUFACTURING MATH…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.

METAL MANUFACTURING PROCESSES…prepares the learner to communicate using proper terminology that is used in industry as it pertains to the use of hand/power tools and measurement. The learner will demonstrate good safety practices while in a workplace environment, demonstrate the proper use of hand and power tools. The learner will complete steel fabrications using hand/power tools and classify and install industrial fasteners. The learner will be introduced to material handling operations by using the overhead crane and forklift.

MILL-2D USING CAM...provides the learner with skills to: explore Computer Aided Manufacturing (CAM) 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.

ORTHOGRAPHIC PROJECTION PRINT…prepares the learner to read prints, make isometric sketches, interpret orthographic projection drawings, to include sections, surface finishes, and tolerancing.

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

PROTOTRAK MILL-SLOT AND HOLE PROGRAMMING...prepares the learner to select cutting tools, set up, program, and operate conversationally programmed vertical mills. Operations to include pockets, angles and position drill and programs. COREQUISITE: 31420353 ProtoTrak Mill-Squaring Programming

PROTOTRAK MILL-SQUARING PROGRAMMING...prepares the learner to select cutting tools, set up, program, and operate conversationally programmed vertical mills. Operations to include face mill, mill slots programs.

WORKPLACE FUNDAMENTALS…prepares the learner to incorporate problem solving, creativity and communication skills into daily workplace habits.