

PRECISION MACHINING TECHNICIAN

Technical Diploma

Program Code: 31-420-10

Total Credits: 53-54

The Precision Machining Technician program prepares graduates for machining positions, an in-demand skill set at the heart of industrial production. Additional training and experience often lead to supervisory, quality assurance, and tool maker positions. In this program you will learn to shape various materials into intricate, precise, usable parts. You'll also work from blueprints and written specifications to select the proper machinery, materials, and tools, and you'll gain proficiency with machine tools such as lathes, mills, grinders, computers, and computerized numerical control (CNC) machines.

To learn more about this program, visit mstc.edu/programs.

ACADEMIC ADVISOR

To schedule an appointment with an academic advisor, call 715-422-5300. Academic advisors will travel to other campuses as necessary to accommodate student needs. For more information about advising, visit mstc.edu/advising.

NEW STUDENT CHECKLIST

Complete the following steps to prepare for your New Student Advising appointment with your academic advisor:

- Submit a Mid-State application at mstc.edu/apply.
- Send official transcripts to:
Mid-State Technical College
Student Services
500 32nd Street North
Wisconsin Rapids, WI 54494
- Complete the Free Application for Federal Student Aid (FAFSA) at fafsa.gov. Mid-State's Financial Aid team is available to assist with your FAFSA application and to answer your financial aid questions. Contact Financial Aid or schedule an appointment at mstc.edu/financial-aid.
- Set up student MyCampus account at mstc.edu/mycampus-assistance.
- Schedule a New Student Advising appointment at mstc.edu/advising.

mstc.edu • 888-575-6782 • TTY: 711



Adams Campus • Marshfield Campus • Stevens Point Downtown Campus • Wisconsin Rapids Campus • Virtual Campus • AMETA® Center

Mid-State does not discriminate on the basis of race, color, national origin, sex, disability, or age in its program, activity, or employment. The following person has been designated to handle inquiries regarding the nondiscrimination policies: Vice President - Human Resources; 500 32nd Street North, Wisconsin Rapids, WI 54494; 715-422-5325 • AAEO@mstc.edu. 3/2026-AC

CAREER PATHWAY



Career pathways help you build your education step by step. Each stage offers one or more credentials that are recognized by employers and lead to real jobs—and you can keep building toward your career goals as you go.

Begin at any point.

Prior Learning

Credit for Prior Learning

- Certifications and Licenses
- Military Experience
- National/Standardized Exams
- Transfer Credit
- Work and Life Experience

Learn about Credit for Prior Learning at mstc.edu/cpl.

High School Credit

- High School Dual Credit
- Mid-State Fast Track

Learn about High School Credit at mstc.edu/dc.

Technical Diploma

- Precision Machining Technician (53-54 Credits)
Start Your Career: Advanced Machine Operator, CNC Machine Operator, CNC Programmer, Job Shop Machinist ,
Quality Control Technician

Bachelor's Degree

For those interested in continuing their education, Mid-State offers transfer guides with various four-year colleges and universities. For more information, visit mstc.edu/transfer.

Other Options

Related Programs: Industrial Mechanical Technician, Manufacturing Operations Management, Mechanical Design Technology, Metal Fabrication

Apprenticeship Opportunity: CNC Machinist

OUTCOMES

Employers will expect you, as a Precision Machining Technician graduate, to be able to:

- Apply basic safety practices in the machine shop.
- Interpret industrial/engineering drawings.
- Apply precision measuring methods to parts inspection.
- Perform basic machine tool equipment setup and operation.
- Perform programming, setup, and operation of CNC machine tools.
- Perform advanced CNC machining operations.

TECHNICAL SKILLS ATTAINMENT

The Wisconsin Technical College System (WTCS) has implemented a requirement that all technical colleges measure outcomes attained by students. This requirement is called Technical Skills Attainment (TSA). The main objective of TSA is to ensure graduates have the technical skills needed by employers. Faculty will let students know when and how the TSA is being assessed in the program.

STUDENT HANDBOOK

Visit mstc.edu/studenthandbook to view Mid-State's student handbook, which contains information about admissions, enrollment, appeals processes, services for people with disabilities, financial aid, graduation, privacy, Mid-State's Student Code of Conduct, and technology.

GRADUATION REQUIREMENT

The GPS for Student Success course is required for all Mid-State program students and is recommended to be completed before obtaining 12 credits. Some students are exempt from this requirement. Please see your academic advisor for more information.

ADDITIONAL COURSES AS NEEDED

The following courses may be recommended or required if the student does not achieve minimum placement scores.

College Reading and Writing 1

10831104

3 credits

Provides learners with opportunities to develop and expand reading and writing skills to prepare for college-level academic work. Students will employ critical reading strategies to improve comprehension, analysis, and retention of texts. Students will apply the writing process to produce well-developed, coherent, and unified written work.

Pre-Algebra

10834109

3 credits

Provides an introduction to algebra. Includes operations on real numbers, solving linear equations, percent and proportion, and an introduction to polynomials and statistics. Prepares students for elementary algebra and subsequent algebra-related courses.

MULTIPLE MEASURES

Students can place into courses using high school GPA and completed classes. Placement can be determined in the following ways:

- **Multiple Measures Writing (MMW)**
High school GPA of 2.6 & successful completion of 2.0 credits of high school writing courses with a "C" or better
- **Multiple Measures Reading (MMR)**
High school GPA of 2.6 & successful completion of 2.0 credits of high school literature courses with a "C" or better
- **Multiple Measures Math 1 (MMM_1)**
High school GPA of 2.6 & successful completion of 1.0 credit of high school math (Algebra 1 or equivalent) with a "C" or better
- **Multiple Measures Math 2 (MMM_2)**
High school GPA of 2.6 & successful completion of 2.0 credits of high school math including Algebra 1 and Algebra 2 with a "C" or better
- **Multiple Measures Science 1 (MMS_1)**
High school GPA of 2.6 & successful completion of 1.0 credit of high school lab science course with a "C" or better
- **Multiple Measures Science 2 (MMS_2)**
High school GPA of 2.6 & successful completion of 1.0 credit of high school chemistry with a "C" or better

Past high school and college transcripts are used in making course placement decisions.

SAMPLE FULL-TIME CURRICULUM OPTION
Precision Machining Technician • 53-54 Total Credits

Term 15-16 Credits	Course Number	Course Name	CPL	Credits
	31804305 or 10804107	Applied Math or College Mathematics	No or Yes	2 or 3
	32420311	Safety, Measurement and Layout	No	1
	32420326	Introduction to Turning Machines	No	2
	32420329	Intermediate Turning Applications	No	5
	32420331	Print Reading for Precision Machining	No	2
	32420373	CNC Lathes Set Up and Operation	Yes	2
	10890102	GPS for Student Success	Yes	1

Term 12 Credits	Course Number	Course Name	CPL	Credits
	31801368	Workplace Communication	No	1
	32420310	Introduction to Solid Modeling	No	2
	32420337	Introduction to Milling Machines	No	2
	32420340	Intermediate Milling Applications	No	5
	32420374	CNC Mills Set Up and Operation	Yes	2

Term 12 Credits	Course Number	Course Name	CPL	Credits
	32420325	Inspection with Geometric Dimensioning	No	2
	32420330	Advanced Turning Applications	No	3
	32420332	Materials and Machinability	No	2
	32420362	CNC Lathes/Manual Programming	Yes	2
	32444377	CNC Lathes Computer Aided Programming	No	2
	32623301	Manufacturing Principles	No	1

Term 14 Credits	Course Number	Course Name	CPL	Credits
	32420341	Advanced Milling Applications	No	3
	32420364	CNC Mills/Manual Programming	No	2
	32420380	Multi-Asix Manual Processes	No	3
	32444378	CNC Mills Computer Aided Programming	No	3
	32444379	Advanced CNC Milling Operations	No	3

Please Note

- Credit for Prior Learning (CPL) options are available for some courses. You can visit mstc.edu/cpl or contact your academic advisor for details.
- This curriculum sequence is only for student planning. Actual student schedules will vary depending on course availability.
- Program completion time may vary based on student scheduling and course availability. For details, go to mstc.edu/schedule.
- Get the latest updates online at mstc.edu.

SAMPLE PART-TIME CURRICULUM OPTION
Precision Machining Technician • 53-54 Total Credits

Term 8 Credits	Course Number	Course Name	CPL	Credits
	32420311	Safety, Measurement and Layout	No	1
	32420326	Introduction to Turning Machines	No	2
	32420331	Print Reading for Precision Machining	No	2
	32420332	Materials and Machinability	No	2
	10890102	GPS for Student Success	Yes	1
Term 6-7 Credits	Course Number	Course Name	CPL	Credits
	31804305 or 10804107	Applied Math or College Mathematics	No or Yes	2 or 3
	32420310	Introduction to Solid Modeling	No	2
	32420337	Introduction to Milling Machines	No	2
Term 6 Credits	Course Number	Course Name	CPL	Credits
	32420329	Intermediate Turning Applications	No	5
	32623301	Manufacturing Principles	No	1
Term 7 Credits	Course Number	Course Name	CPL	Credits
	32420340	Intermediate Milling Applications	No	5
	32420374	CNC Mills Set Up and Operation	Yes	2
Term 6 Credits	Course Number	Course Name	CPL	Credits
	31801368	Workplace Communication	No	1
	32420325	Inspection with Geometric Dimensioning	No	2
	32420330	Advanced Turning Applications	No	3
Term 8 Credits	Course Number	Course Name	CPL	Credits
	32420341	Advanced Milling Applications	No	3
	32420364	CNC Mills/Manual Programming	No	2
	32444378	CNC Mills Computer Aided Programming	No	3
Term 6 Credits	Course Number	Course Name	CPL	Credits
	32420373	CNC Lathes Set Up and Operation	Yes	2
	32420362	CNC Lathes/Manual Programming	Yes	2
	32444377	CNC Lathes Computer Aided Programming	No	2
Term 6 Credits	Course Number	Course Name	CPL	Credits
	32420380	Multi-Asix Manual Processes	No	3
	32444379	Advanced CNC Milling Operations	No	3

Advanced CNC Milling Operations

32444379

3 credits

This course will utilize classroom presentations, discussions and hands-on lab activities to build on the skills from previous classroom experiences to equip learners to follow the entire process of manufacturing from print to part and through final inspection using CNC milling machines. Learners will explore in-process automated part inspection with the use of machine based probing systems. Additionally, students will become accustomed to the use of Wire EDM machines and Coordinate Measuring Machines as they progress through the course.

Corequisite: CNC Mills/Manual Programming 32420364

Advanced Milling Applications

32420341

3 credits

Students in this class will receive further insight into milling machine concepts. This course places major emphasis on work-holding methods with the use of jigs and fixtures. Jig and fixture design elements for location and rigid work holding in both a production environment as well as single piece runs, and advanced cutting tools and cutting processes will be explored to focus on manufacturing efficiency.

Prerequisite: Intermediate Milling Applications 32420340

Advanced Turning Applications

32420330

3 credits

Students in this class will receive further insight into turning machine concepts. This course includes a safety review and adds depth in advanced cutting tool materials such as ceramics, cubic boron nitride (CBN), and polycrystalline diamonds (PCD). Learners will explore differing fixturing and tooling needs for a production environment as well as planning for single piece runs.

Prerequisite: Intermediate Turning Applications 32420329

Applied Mathematics

31804305

2 credits

Students taking Applied Mathematics make and convert various measurements. Students use formulas to solve problems. They compute dimensions of geometric shapes. Students use statistical tools to represent and analyze data. They analyze various financial situations. Students use basic right triangle trigonometry to solve problems. In each topic area, students solve application problems.

CNC Lathes Computer Aided Programming

32444377

2 credits

This course introduces learners to Computer-Aided Machining/Manufacturing (CAM). Demonstrations and hands-on use of CAD/CAM software and hardware will be used. Major emphasis is placed on geometry creation and editing functions, process planning, proper cutter selection, feed and speed selection, and tool path generation along with post processing to CNC lathes. Some basic machine set-up and operation are included to verify program operation.

Prerequisite: Introduction to Solid Modeling 32420310

CNC Lathes Set Up and Operation

32420373

2 credits

In this introductory Computer Numerical Control (CNC) machining course, students will practice the skills needed to setup and operate CNC lathes. Classroom presentations and lab projects will focus on safety, theory, terminology as it relates to completing machine setups in the CNC lathe. Topics covered will be tool and work offset setting, work holding and quality. Learners will work with proven CNC part programs and setup documents to create parts to specifications and ensure all parts of a production run maintain quality throughout the run.

CNC Lathes/Manual Programming

32420362

2 credits

Covers NC/CNC terminology and introduces students to computers and components of NC/CNC lathes. All programming is manual word address (G+M Code) basics. Includes basic CNC lathe operation.

CNC Mills Computer Aided Programming

32444378

3 credits

This course introduces learners to Computer-Aided Machining/Manufacturing (CAM). Demonstrations and hands-on of CAD/CAM software and hardware will be used. Major emphasis is placed on geometry creation and editing functions, process planning, proper cutter selection, feed and speed selection, and tool path generation along with post processing to CNC milling machines and machining centers. Some basic machine set-up and operation are included to verify program operation.

Prerequisite: Introduction to Solid Modeling 32420310

CNC Mills Set Up and Operation

32420374

2 credits

In this introductory Computer Numerical Control (CNC) machining course, students will practice the skills needed to setup and operate CNC milling machines. Classroom presentations and lab projects will focus on safety, theory, terminology as it relates to completing machine setups in the CNC milling machine. Topics covered will be tool and work offset setting, work holding and quality. Learners will work with proven CNC part programs and setup documents to create parts to specifications and ensure all parts of a production run maintain quality throughout the run.

CNC Mills/Manual Programming

32420364

2 credits

Covers NC/CNC terminology and introduces students to computers and components of NC/CNC mills. All programming is manual word address (G+M code) basics. Includes basic CNC mill operation.

College Mathematics

10804107

3 credits

This course is designed to review and develop fundamental concepts of mathematics in the areas of algebra, geometry, trigonometry, measurement and data. Algebra topics emphasize simplifying algebraic expressions, solving linear equations and inequalities with one variable, solving proportions and percent applications. Geometry and trigonometry topics include; finding areas and volumes of geometric figures, applying similar and congruent triangles, applying Pythagorean Theorem, and solving right triangles using trigonometric ratios. Measurement topics emphasize the application of measurement concepts and conversion techniques within and between U.S. customary and metric system to solve problems. Data topics emphasize data organization and summarization skills, including: frequency distributions, central tendency, relative position and measures of dispersion. Special emphasis is placed on problem solving, critical thinking and logical reasoning, making connections, and using calculators.

Prerequisite: High School GPA of 2.6 and MMM_1 or Accuplacer Arithmetic of 250 and QAS 234 or ACT Math score of 17 or Pre-Algebra 10834109 with a "C" or better

Inspection with Geometric Dimensioning

32420325

2 credits

This course will familiarize learners with interpreting Geometric Dimensioning and introduce dimensional metrology. Activities and classroom presentations will provide insight into the use of direct and indirect measuring tools, instrument calibration, and the use of Coordinate Measuring Machines, and quality documentation. Emphasis of the course will be on interpretation of Geometric Dimensioning and using metrology fundamentals to ensure manufactured components meet design specifications.

Intermediate Milling Applications

32420340

5 credits

This course will develop additional skills needed for effective milling machine operations. Common work holding and fixturing tools will be utilized to create parts accurately and efficiently. Classroom presentation and lab activities will be utilized to hone the learner's skills with manual milling machines. Attention will be on safety, machine setups, operations, calculations, and inspection.

Corequisite: Introduction to Milling Machines 32420337

Intermediate Turning Applications

32420329

5 credits

Students enrolled in this course will build additional skills from previous classroom experiences related to turning machines. Presentations and lab activities will focus on machine setups, metal removal techniques, and common calculations encountered on the job. Lab projects will be created using techniques to ensure accuracy, efficiency, and repeatability with an introduction to CNC. Emphasis will be put on common turning procedures with inspection processes to produce quality components.

Corequisite: Introduction to Turning Machines 32420326

Introduction to Milling Machines

32420337

2 credits

Explore the fundamentals of basic operations and safety of manual mills. Through the utilization of classroom and lab activities learners will acquire a basic understanding of the Milling Machine components as well as the cutting tools and basic work holding devices that may be used on the machine. The importance of proper tool selection and usage as utilizing the Milling Machines components properly will be the concentration.

Introduction to Solid Modeling

32420310

2 credits

Introduces students creating computer-aided drafting (CAD) represented solid models for use in the manufacturing arena. As an introductory course in three-dimensional modeling, learners use computer software to develop two-dimensional sketches and use modeling tools to create solid models on the computer. Students also use the models to create and detail two-dimensional engineering drawings for use on the manufacturing floor. Computer knowledge and prior knowledge of drawing/drafting techniques is recommended.

Introduction to Turning Machines

32420326

2 credits

This course will introduce functions and capabilities of turning machines known as lathes. Activities and hands-on lab exercises will be used to introduce learners to the most common applications of lathes in the machine shop. Shop safety, terminology, and identification of turning machines and related equipment in a machine shop environment will be introduced. Learners will also gain an understanding of basic setup and metal cutting processes performed on turning machines.

Manufacturing Principles

32623301

1 credit

As competition for market share continues to increase, manufacturers rely on innovations in technology, methods, and practices to give them the edge they need. To remain competitive globally, the watchwords are productivity, efficiency, and quality. In this course, students examine some of the practices that many manufacturing operations have come to rely on to make their operations competitive, efficient, and cost-effective. Topics covered in this class include the principles of lean manufacturing, value versus non-value added waste, 5S methodology, value stream mapping, setup reduction and quick changeover, cellular flow, building a lean culture, total productive maintenance, and statistical process control (SPC).

Materials and Machinability

32420332

2 credits

This course covers sources, strengths, and industry uses for common metals and materials.

Multi-Axis Machining Processes

32420380

3 credits

Multi-Axis CNC machines have become standard in the machining industry. Participants in this course will become familiar with the set-up procedures for 4 and 5 axis milling machines, manual programming techniques, and advanced CAM programming for multi-axis positioning and contouring. Lab activities and classroom presentations will prepare students for the added machining versatility of multi-axis machines.

Prerequisites: CNC Lathes Set Up and Operation 32420373 and CNC Mills Set Up and Operation 32420374

Print Reading for Precision Machining

32420331

2 credits

Learners are introduced to interpreting multi-view orthographic projection drawings, callouts and symbols, GD&T, dimensioning, tolerancing standards, and assembly drawings in relationship to the machining industry.

Safety, Measurement and Layout

32420311

1 credit

In this course students become familiar with the machine shop environment. An overview of safety is covered with emphasis in lathes, mills, cut-off machines, and grinders. Learners are also introduced to measurement with various types of precision measurement tools, including micrometers, height gages, and calipers.

Workplace Communication

31801368

1 credit

Analyze workplace communication situations to develop professional verbal and written communication skills. Learners apply verbal and written communication skills, as well as conflict resolution strategies, to improve workplace communication climates and promote personal and professional growth.