

Program Information

The CNC Design & Manufacturing Technology associate of Applied Science (AAS) is a 69-credit degree program includes technical and general education components to provide the skills for trade entry plus the possibility to pursue a Bachelor of Arts (BA) degree with cooperating colleges and universities.

The CNC Manufacturing Technology degree program prepares people to write and edit CNC programs, perform complex setups, basic troubleshooting of machine problems, cycle time reduction practices, fixture design and building, recognize areas for process improvements and operate the following equipment: manual lathes, grills mills, grinders, CNC programming, CNC mills, CNC lathes, coordinate measuring machine, CAD/CAM and 4&5 axis CNC mills.

Graduates are also skilled in the areas of basic troubleshooting of machine problems, cycle time reduction practices, fixture design and building, blueprint reading, GD&T, statistical process control, lean manufacturing, math, inspection and the correct sequence of operation required. Graduates may also be skilled in the areas of tool and cutter, CNC wire EDM and CNC sinker EDM, and CNC parametric programming depending on elective taken.

Program Learning Outcomes

By completing this program, students will achieve the following learning outcomes.

1. The student will demonstrate machine skills and practices consistent with the manufacturing industry.
2. Exhibit safety principles and practices in a manufacturing environment.
3. Communicate effective use of machine shop theory and process terminology.
4. Work efficiently as a member in a machine shop environment to manage time and meet project deadlines.
5. Work effectively as a member of a team while accepting constructive criticism.

Course Prerequisites

Although no prior knowledge or experience is necessary to succeed in this program, a background in shop math and algebra, mechanical drafting machine shop and mechanical skills can be helpful.

Some courses may require appropriate test score or completion of basic math, basic English and/or reading courses with a "C" or better.

Graduation Requirements

All Anoka Technical College students seeking an Associate in Applied Science (AAS), diploma, or certificate must meet the cumulative grade point average (GPA) of 2.0 or higher.

Transfer Opportunities

To see how credits from this program may transfer into other Anoka Technical College programs or into a program at another college, visit:

- [Minnesota Transfer](http://www.mntransfer.org/students/plan/s_agreements.php?numResults=25&archive=false&from_inst=70&from_prog=&to_inst=&Search=Search): (www.mntransfer.org/students/plan/s_agreements.php?numResults=25&archive=false&from_inst=70&from_prog=&to_inst=&Search=Search)
- [Anoka Technical College transfer student](http://www.anokatech.edu/BecomeStudent/Transfers.aspx) (www.anokatech.edu/BecomeStudent/Transfers.aspx)

Industry Information

The machinist is a skilled metal worker who produces metal parts by using machine tools and hand tools. Training and experience enable the machinist to plan and carry through all the operations needed to turn out a finished machine product and to switch readily from one kind of product to another. The machinist's background and knowledge enables him/her to turn a block of metal into an intricate, precise part.

All options are an art as well as a skill, and are considered to be demanding occupations. There is a great variety in the construction of dies and molds, depending on the design of a part, the type of materials used, the ingenuity of the designer, and the knowledge and skill of the die and mold maker, who must machine intricate components of various tooling to tolerances expressed in fractions of one-thousandths of an inch.

Employees in this position are expected to write and edit CNC programs, perform complex setups, basic troubleshooting of machine problems, cycle time reduction practices, fixture design and building and recognize areas for process improvements on manual lathes, drills, mills, grinders, CNC mills, CNC lathes, CNC wire EDM and CNC sinker EDM, coordinate measuring machine, and CAD/CAM. Employees are also expected to invoke lean manufacturing process and practices.

Wages/Outlook/Advancement

Wage information is available from the [Minnesota Department of Employment and Economic Development](https://mn.gov/deed/job-seekers/job-outlook/) (https://mn.gov/deed/job-seekers/job-outlook/).

Technical Education: 54 Credits

<input type="checkbox"/> MACH 1101 Milling	4
<input type="checkbox"/> MACH 1106 Lathe	3
<input type="checkbox"/> MACH 1121 Metrology	2
<input type="checkbox"/> MACH 1132 Blueprint Reading I	3
<input type="checkbox"/> MACH 1140 CAD I	1
<input type="checkbox"/> MACH 1200 Advanced Machining.....	3
<input type="checkbox"/> MACH 1220 Grinding.....	2
<input type="checkbox"/> MACH 1231 Blueprint Design/ CAD II	1
<input type="checkbox"/> MACH 1240 Geometric Dimensioning & Tolerancing	3
<input type="checkbox"/> MACH 1251 CNC Machining.....	3
<input type="checkbox"/> MACH 1261 CNC Programming I.....	3
<input type="checkbox"/> MACH 1275 Quality Standards	1

(continued)

2019-2020

CNC Design & Manufacturing Technology

Associate of Applied Science (AAS) Degree

- MACH 2310 CNC Milling 3
- MACH 2320 CNC Turning 3
- MACH 2331 CAM 1
- MACH 2340 CNC Programming II 2
- MACH 2351 Mold/Die Making Theory 3
- MACH 2360 Fixture and Tooling 4
- MACH 2451 CNC Design and Manufacture 3
- MACH 2462 Multi-Axis Milling 3
- MACH 2472 Multi-Axis Turning 3

General Education/MnTC Requirements: 15 Credits

Fifteen (15) general education credits of Minnesota Transfer Curriculum (MnTC) are required. MnTC credits must be from three different goal areas. Student is required to take:

- MATH 1650 College Trigonometry 3
- ENGL 1107 Composition I 4
- General Education/MnTC Courses 8

Also see: Advanced CNC Machine Technology diploma and Machine Technology Certificates 1, 2, and 3

Start Dates

Fall Semester August
Spring Semester January

Faculty Contact

[Brendon Paulson](#) 763-576-4243
[Matt Rogers](#) 763-576-4088
[Jerry Showalter](#) 763-576-4043

For information on how to apply, to schedule a tour, or for service during summer hours, contact Enrollment Services at 763-576-7710 or EnrollmentServices@anokatech.edu

Sample Program Sequence

Full Time

		First Semester	Second Semester
1st YEAR	MACH 1101	4	MACH 1200 3
	MACH 1106	3	MACH 1220 2
	MACH 1121	2	MACH 1231 1
	MACH 1132	3	MACH 1240 3
	MACH 1140	1	MACH 1251 3
	MATH 1650	3	MACH 1261 3
	TOTAL	16	MACH 1275 1
			Gen Ed/MnTC 2
			TOTAL 18
2nd YEAR	Third Semester		Fourth Semester
	MACH 2310	3	ENGL 1107 4
	MACH 2320	3	MACH 2451 3
	MACH 2331	1	MACH 2462 3
	MACH 2340	2	MACH 2472 3
	MACH 2351	3	Gen Ed/MnTC 6
	MACH 2360	4	TOTAL 19
TOTAL	16		



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