

Program Information

The CNC Design & Manufacturing Technology associate of Applied Science (AAS) is a 69-credit degree program which 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, drills, 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

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.

Industry and Career Outlook

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.

Wage information is available from the [Minnesota Department of Employment and Economic Development](#)

Program Start Dates

Fall Semester.....August
 Spring SemesterJanuary

Course Prerequisites

Courses in this program may require a prerequisite, please see [course descriptions](#) for more details.

MnTC General Education Requirements

This program requires completion of the following fifteen credits of general education from at least three goal areas of the Minnesota Transfer Curriculum (MnTC). Refer to the [MnTC course list](#) for elective courses:

- ENGL 1107 Composition I (Goal 1&2)..... 4
- MATH 1650 College Trigonometry (Goal 4)..... 3
- MnTC Electives 8

Program Sequence

First Semester	16
<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	3
<input type="checkbox"/> MACH 1140 CAD I	1
<input type="checkbox"/> MATH 1650 College Trigonometry	3
Second Semester	18
<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
<input type="checkbox"/> MnTC Elective	2
Third Semester	16
<input type="checkbox"/> MACH 2310 CNC Milling.....	3
<input type="checkbox"/> MACH 2320 CNC Turning	3
<input type="checkbox"/> MACH 2331 CAM	1
<input type="checkbox"/> MACH 2340 CNC Programming II	2
<input type="checkbox"/> MACH 2351 Mold/Die Making Theory.....	3
<input type="checkbox"/> MACH 2360 Fixture and Tooling	4



(continued)

2023-2024

CNC Design & Manufacturing Technology

Associate of Applied Science (AAS) Degree

Fourth Semester	19
<input type="checkbox"/> ENGL 1107 Composition I	4
<input type="checkbox"/> MACH 2451 CNC Design and Manufacture	3
<input type="checkbox"/> MACH 2462 Multi-Axis Milling	3
<input type="checkbox"/> MACH 2472 Multi-Axis Turning.....	3
<input type="checkbox"/> MnTC Electives.....	6

Graduation Requirements

Students must earn a cumulative 2.0 GPA or higher to be eligible for graduation from this program.

Faculty Contact

Brendon Paulson	763-576-4243
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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

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