Central Lakes College, Staples Campus 2025-2026

CNC Technologies

Associate of Applied Science Degree (A186)

Required Discipline 49
MnTC*** 15
Total Credits 64

Required Courses

Required Discipline Courses (49 credits)

MTTS 1110	Principles of Machine Operations I	2 cr
MTTS 1111*	Principles of Machine Operations II	2 cr
MTTS 1120	Machine Operations I	3 cr
MTTS 1121	Machine Operations II	3 cr
MTTS 1122*	Machine Operations III	3 cr
MTTS 1124	Introduction to Engineering Graphics	2 cr
MTTS 1130	Print Reading	2 cr
MTTS 1134*	CNC Operations	3 cr
MTTS 1135	CNC Programming and Process Planning	2 cr
MTTS 1137	Grinding I	1 cr
MTTS 2108	CAD/CAM	2 cr
MTTS 2110*	Geometric Dimensioning & Tolerancing	2 cr
MTTS 2118*	Jigs and Fixtures	1 cr
MTTS 2120	Tool and Die: Theory	1 cr
MTTS 2122*	Tool and Die: Design and Build	4 cr
MTTS 2124	Mold: Theory	1 cr
MTTS 2126*	Mold: Design and Build	4 cr
MTTS 2130*	CNC Milling and Turning	4 cr
MTTS 2134*	CNC Operations Theory	2 cr
MTTS 2137*	Grinding II	1 cr
RAST 1109	Computers in Industry	2 cr
RAST 1110	Intro to Manufacturing	2 cr

Required MnTC Courses

***An A.A.S. degree requires a minimum of 15 credits selected from at least three of the ten goal areas of the Minnesota Transfer Curriculum (MnTC).

ENGL 1422	Practical Writing (Goal 1)	3 cr
Goal 4 MATH Course		3 cr
Minnesota Transfer Curriculum Courses		9 cr

*Denotes Prerequisites

GRADUATION REQUIREMENT - 64 CREDITS

Description

In the Computer Numerical Controlled (CNC) Technologies program students learn how to use hand tools, lathes and mills, computer-aided drafting and design software, power machinery, and computerized equipment. The Associate of Applied Science (A.A.S.) Degree curriculum includes geometric tolerancing, CAD/CAM, and advanced computer numerical controlled (CNC) milling and turning operations. Instruction takes place in a well-equipped shop for a hands-on, practical experience.

Outcomes

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

- Read and interpret a mechanical working drawing;
- Perform precision measurement, layout, drilling, sawing, turning, milling, and precision grinding safely;
- Perform shop calculations;
- Program, setup, and operate a computer numerical control (CNC) turning and machining center;
- Anticipate, choose, and troubleshoot the proper tooling based on manufacturing requirements;
- Manufacture assemblies to specification to produce a plastic injection mold;
- Manufacture assemblies to specification to produce a working metal stamping die; and
- Apply effective communication and interpersonal skills in the machining industry.

Pre-Program Requirements

Some courses may require students to meet College Placement Levels in reading, writing, and/or math. See an advisor for more information.

For insurance purposes, internships may require that students be 18 years old.

Graduation Requirements

In addition to the program requirements, students must meet the following conditions in order to graduate:

- College Cumulative GPA Requirement: cumulative grade point average (GPA) of credits attempted and completed at CLC must be at least 2.0;
- College Technical Core GPA Requirement: cumulative GPA of credits attempted and completed towards the technical core of the diploma or degree must be at least 2.0;
- Residency Requirement: students must complete 25% of their credits at Central Lakes College.

Career & Transfer

Computer numerically controlled (CNC) machine tool programmers and operators develop and operate programs to control the machining or processing of metal or plastic parts by automatic machine tools, equipment, or systems. Most jobs are in manufacturing settings in a variety of industries including machine shops, aerospace, medical, automotive, and metalworking machining. Math, computer, and engineering skills are important in this field, but machinists also use a creative side to solve problems and make new designs. Examples of career titles in this field include numerical control machine operator, computer numerical controlled (CNC) programmer, robotic machine operator, numerical control drill press operator, lathe operator, automated cutting machine operator, tool and die maker, precision instrument maker, and mold maker.

Academic Plan

Semester One (17 credits)

MTTS 1110	Principles of Machine Operations I	2 cr
MTTS 1120	Machine Operations I	3 cr
MTTS 1121	Machine Operations II	3 cr
MTTS 1130	Print Reading	2 cr
RAST 1109	Computers in Industry	2 cr
RAST 1110	Intro to Manufacturing	2 cr
Minnesota Transfer Curriculum Courses		3 cr

Semester Two (16 credits)

ENGL 1422	Practical Writing (Goal 1)	3 cr
MTTS 1111*	Principles of Machine Operations II	2 cr
MTTS 1122*	Machine Operations III	3 cr
MTTS 1124	Introduction to Engineering Graphics	2 cr
MTTS 1134*	CNC Operations	3 cr
MTTS 1135	CNC Programming and Process Planning	2 cr
MTTS 1137	Grinding I	1 cr

Semester Three (17 credits)

Goal 4 MATH Course		3 cr
MTTS 2108	CAD/CAM	2 cr
MTTS 2110*	Geometric Dimensioning & Tolerancing	2 cr
MTTS 2118*	Jigs and Fixtures	1 cr
MTTS 2130*	CNC Milling and Turning	4 cr
MTTS 2134*	CNC Operations Theory	2 cr
Minnesota Transfer Curriculum Courses		3 cr

Semester Four (14 credits)

MTTS 2120	Tool and Die: Theory	1 cr
MTTS 2122*	Tool and Die: Design and Build	4 cr
MTTS 2124	Mold: Theory	1 cr
MTTS 2126*	Mold: Design and Build	4 cr
MTTS 2137*	Grinding II	1 cr
Minnesota Transfer Curriculum Courses		3 cr