Central Lakes College, Staples Campus 2025-2026

CNC Technologies

Diploma (D186)

Total Credits 55

Required Courses

ENGL 1422	Practical Writing (Goal 1)	3 cr
MATH 1500**	Applied MATH **OR**	
Goal 4 MATH Course**		3 cr
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	Introduction to Manufacturing	2 cr

**Denotes Prerequisites*

***Take MATH 1500 if on the diploma path. Take a Goal 4 MATH course if on the AAS path.*

GRADUATION REQUIREMENT - 55 CREDITS

Description

In the Computer Numerical Controlled (CNC) Technologies Diploma you will learn how to use hand tools, power machinery, and computerized equipment. In addition, you will learn how to use lathes, mills and grinders. Our 2-year diploma curriculum includes the use of computer-aided drafting (CAD) and design software. Programming of CNC machines is accomplished with the use of computer-aided machining (CAM) software. Instruction takes place in a well-equipped shop to provide 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

The machine shop technologist does precise creation and modification of metal parts. In this program, students learn how to use machines to make various parts for the repair, design, or manufacturing of other products. Most jobs are in manufacturing settings and in a variety of industries, including aerospace, medical, and powersports. Math, computer, and engineering skills are important in this field, but machinists also use a creative side to solve problems and make new designs. Machinists work with their hands to create and fix tools and machines and work on parts that are cast, formed, shaped, or molded. They also work on parts that are heat-treated or cut. In addition, students can work on parts that are pressed, fused, stamped, or worked. A CLC graduate is well prepared for related career opportunities including machinists, tool and die makers, mold makers, maintenance machinists, machine setup lead, machine operator, quality control analyst, machine tool sales person, industrial repairer, plastics injection, and many other related positions.

Academic Plan

Semester One (17 credits)

MATH 1500**	Applied MATH **OR**	
Goal 4 MATH Course**		3 cr
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

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 & Process Planning	2 cr
MTTS 1137	Grinding I	1 cr

Semester Three (11 credits)

MTTS 2108	CAD/CAM	2 cr
MTTS 2110*	Geometric Dimensioning and 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

Semester Four (11 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

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