

# CNC Technologies

Diploma (D186)

## Required Courses

CMAE 1528	Career Success Skills .....	1 cr
ENGL 1422	Practical Writing .....	3 cr
MATH 1500	Applied Mathematics .....	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 1131*	Print Applications .....	2 cr
MTTS 1134*	CNC Operations .....	3 cr
MTTS 1135	CNC Programming and Process Planning .....	2 cr
MTTS 1140	CAD/CAM I.....	2 cr
MTTS 2110	Geometric Dimensioning and Tolerancing .....	1 cr
MTTS 2112	Metallurgy .....	1 cr
MTTS 2116*	Introduction to EDM.....	2 cr
MTTS 2118*	Jigs and Fixtures.....	1 cr
MTTS 2130*	CNC Milling and Turning .....	4 cr
MTTS 2134*	CNC Operations Theory .....	2 cr
MTTS 2140*	CAD/CAM II.....	2 cr
RAST 1109	Computers in Industry.....	2 cr

\*Denotes Prerequisites

## GRADUATION REQUIREMENT - 48 CREDITS

### Description

In our 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 and mills. Our one-year diploma curriculum includes the use of computer-aided-drafting and design software. 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 center and machining center;
- Anticipate, choose, and troubleshoot the proper tooling based on manufacturing requirements;
- Manufacture assemblies to specification; 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 manufacture of other products. Most jobs are in manufacturing settings and in a variety of industries, including aerospace, medical, and paper. 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, cut, or twisted. 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 (16 credits)

CMAE 1528 Career Success Skills..... 1 cr

#### OR Substitute with

RAST 1110 Intro to Manufacturing..... 2 cr

MATH 1500 Applied Mathematics ..... 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

### Semester Two (16 credits)

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 1131\* Print Applications ..... 2 cr

MTTS 1134\* CNC Operations..... 3 cr

MTTS 1135 CNC Programming and Process Planning..... 2 cr

MTTS 1140 CAD/CAM I ..... 2 cr

### Semester Three (13 credits)

ENGL 1422 Practical Writing (Goal 1) ..... 3 cr

MTTS 2110 Geometric Dimensioning and Tolerancing..... 1 cr

MTTS 2118\* Jigs and Fixtures ..... 1 cr

MTTS 2130\* CNC Milling and Turning..... 4 cr

MTTS 2134\* CNC Operations Theory..... 2 cr

MTTS 2140\* CAD/CAM II ..... 2 cr

### Semester Four (3 credits)

MTTS 2112 Metallurgy ..... 1 cr

MTTS 2116\* Introduction to EDM ..... 2 cr