MINNESOTA STATE COLLEGE SOUTHEAST

CNC Machine Tool

Winona Campus

OVERVIEW

In the Southeast CNC Machine Tool program, you'll learn the precision skills of CNC operations on state-of-the-art equipment. We offer the training and education you'll need for a rewarding career in the field of precision CNC machining and manufacturing.

Our program has a strong emphasis on CNC operation, programming, and 3D modeling. You will learn to produce a CAD 3D model, program a CNC machine with your model, and machine the part on a cutting edge CNC machine. Our advanced manufacturing lab is equipped with 17 CNC machines, including Hurco vertical mills, Doosan lathes, a Haas toolroom mill, a 2022 live tooling Doosan lathe, a 2022 Haas toolroom lathe, and our new 2024 Haas UMC 750 5-axis mill.

The curriculum at Southeast is based on the philosophy that hands-on is the best way to learn CNC operations and programming.

MAJORS WITHIN

CNC Machine Tool	Diploma	61 credits
Precision Machining	Diploma	32 credits
Machining Basics	Certificate	13 credits
Engineering and CNC	Certificate	11 credits

Estimated costs for each major including tuition, books and supplies are posted on **southeastmn.edu** under Academics > Academic Programs by Degree.

PROGRAM OUTCOMES

Program graduates will be able to:

1. Be employable at entry level machining jobs in related fields.
2. Use the basic skill and knowledge of machine shop operations in manual and CNC machining to produce parts to blueprint specifications.
3. Demonstrate safe work habits.
4. Clearly communicate through verbal and written skills.
5. Use the math and computer skills necessary in the machining trades.

PROGRAM HIGHLIGHTS

20+ stations of Computer Aided Drafting (CAD) and Computer Aided Machining

(CAM) programming software available for student training

70% of coursework is hands-on

Computer Numerical Control (CNC) machines, wire electrical discharge machining (edm), turning and milling technology

Focus is on keeping up with the technology used in industry

Employment opportunities are abundant locally as well as regionally

CAREER OPPORTUNITIES

Micro Machining
Medical Machining
Moldmaker
Diemaker
Toolmaker
CNC Machinist
Production Machinist
General Machinist
CAM Programmer

JOB PLACEMENT

Nearly 100%

southeastmn.edu

A member of the Minnesota State system
Minnesota State College Southeast is an affirmative action/equal opportunity educator and employer.
This document is available in an alternative format upon request. If you need an accommodation, please call 507-453-2700.

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CNC Machine Tool

Sample Program Plan

Please note that this is a sample program schedule. Your schedule may vary depending upon your needs, goals, and course availability. Please meet with your advisor to plan your schedule each semester.

CNC Machine Tool - 2-year Diploma

Course No.	Course Name	Credits
First Semester (Fall)		
CMAE 1510	Print Reading	2
MACH 1601	Introduction to Precision Machining	4
MACH 1610	Precision Measuring and Gauging	2
MACH 1615	Precision Machining Processes	3
COMM 1015	Job Seeking Skills	1
GenEd	Math Requirement (see advisor)	2
Semester total		**14**
Second Semester (Spring)		
MACH 1625	Engineering Drawings 2	2
MACH 1630	Introduction to CNC Theory	3
MACH 1642	CNC Operations 1	2
MACH 1643	CNC Operations 2	2
MACH 1650	Introduction to EDM	2
MACH 1662	Introduction to CAD/CAM + 3D Printing	3
GenEd	English Requirement (see advisor)	2
Semester total		**16**
Summer Semester Course		
MACH 1621	Internship	3
Third Semester (Fall)		
MACH 2643	CNC Precision Machining Mill	5
MACH 2645	CNC Precision Machining Lathe	5
MACH 2637	CAM Programming and Toolmaking Application 1	3
MACH 2660	Advanced CAD/CAM 1	3
Semester total		**16**
Fourth Semester Spring		
MACH 2639	CAM Programming and Toolmaking Application 2	3
MACH 2640	CNC Precision Machining Capstone	5
MACH 2642	CNC Precision Machining App	4
Semester total		**12**
Total Required Credits		**61**

Precision Machining - 1-yr Diploma

Course No.	Course Name	Credits
First Semester (Fall)		
CMAE 1510	Print Reading	2
MACH 1601	Introduction to Precision Machining	4
MACH 1610	Precision Measuring and Gauging	2
MACH 1615	Precision Machining Processes	3
GenEd	Math Requirement (see advisor)	2
GenEd	English Requirement (see advisor)	2
Semester total		**15**
Second Semester (Spring)		
MACH 1625	Engineering Drawings 2	2
MACH 1630	Introduction to CNC Theory	3
MACH 1642	CNC Operations 1	2
MACH 1643	CNC Operations 2	2
MACH 1650	Introduction to EDM	2
MACH 1662	Introduction to CAD/CAM + 3D Printing	3
Technical Elective (see advisor)		2
COMM 1015	Job Seeking Skills	1
Semester total		**17**
Total Required Credits		**32**

Machining Basics - Certificate

Course No.	Course Name	Credits
First Semester (Fall)		
CMAE 1510	Print Reading	2
MACH 1601	Introduction to Precision Machining	4
MACH 1610	Precision Measuring and Gauging	2
MACH 1615	Precision Machining Processes	3
Math Requirement (see advisor)		2
Total Required Credits		**13**

Engineering and CNC - Certificate

Course No.	Course Name	Credits
First Semester (Fall)		
CMAE1510	Print Reading	2
MACH1610	Precision Measuring and Gauging	2
MACH1642	CNC Operations 1	2
MACH1643	CNC Operations 2	2
MACH1662	Introduction to CAD/CAM + 3D Printing	3
Total Required Credits		**11**