MACHINE TECHNOLOGIES

Associate of Applied Science Degrees

Advanced Manufacturing Center- Center for Business, Industry, Technology, & Public Service
CCD.edu/Machining

CNC Manufacturing

This program prepares you with the entry-level skills necessary to perform tasks of developing 3D programming to operate a Computer Numerical Controlled (CNC) machining center.

PROGRAM ADMISSION REQUIREMENTS
You must meet the minimum assessment scores or prerequisites required for general education courses in the program. Refer to the course descriptions section of this catalog for course prerequisites. You may take individual courses, if the course prerequisites are met, prior to being accepted into this program.

COURSE MAP

Course	Title	Credits
First Semester		
MAC 100	Machine Shop Safety	1
MAC 101	Introduction to Machine Shop	3
MAC 102	Print Reading for Machinists	3
MAT 108	Technical Mathematics	4
MAC 203	Introduction to CNC Operations	6
	Subtotal	17
Second Semester		
MAC 250	Advanced Inspection Techniques	3
CIS 118	Introduction to PC Applications	3
MAC 201	Introduction to CNC Turning Operations	3
MAC 205	Introduction to CNC Milling Operations	3
Choose One Composition Course		3
ENG 131	Technical Writing I GT-CO1	
ENG 121	English Composition I: GT-CO1	
	Subtotal	15
Third Semester		
COM 115	Public Speaking	3
MAC 145	Production Manufacturing Concepts	3
MAC 202	CNC Turning Operations II	3
MAC 206	CNC Milling Operations II	3
CAD 101	Computer Aided Drafting I	3
	Subtotal	15
Fourth Semester		
MAC 245	CAD/CAM 3D	3
MAC 252	Practical Metallurgy	3
MAC 278	Machining Workship	3
MAC 240	CAD/CAM 2D	3
Choose One Elective		3
POS 105	Intro to Political Science: GT-SS1	
SOC 101	Introduction to Sociology I: GT-SS3	
	Subtotal	15
	Total Credits	62

Certificates

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Community College of Denver currently offers seven certificates in machine technologies.

- Basic Machining
- Intermediate Machining
- CNC Machine Tool Operator
- Industrial Maintenance Technologies
- Multi-Axis Lathe
- CNC Wire EDM
- Five-Axis Milling Machine

Basic Machining

The basic machining certificate instructs students in the basics of shop safety, drill presses, machine shop math, basic CNC mill, and lathes. This certificate is the logical starting point for the more comprehensive certificates and degrees in the machine technologies program.

PROGRAM ADMISSION REQUIREMENTS
Meet minimum assessment scores or prerequisites required for general education courses in the program. You may take individual courses, if the course prerequisites are met, prior to being accepted into this program.

COURSE MAP

Code	Title	Credits
MAC 100	Machine Shop Safety	1
MAC 101	Introduction to Machine Shop	3
MAC 102	Print Reading for Machinists	3
MAC 203	Introduction to CNC Operations	6
MAT 108	Technical Mathematics	4
Total Credits		17

Intermediate Machining

The intermediate machining certificate prepares you with the job-entry skills necessary to perform most operations on the vertical mill, horizontal mill, lathe and grinder/shaper. This certificate is the second logical step for the more comprehensive certificates and degrees in the machine technologies program.

PROGRAM ADMISSION REQUIREMENTS
Meet minimum assessment scores or prerequisites required for general education courses in the program. You may take individual courses, if the course prerequisites are met, prior to being accepted into this program.

COURSE MAP

Course	Title	Credits
First Semester		
MAC 100	Machine Shop Safety	1
MAC 101	Introduction to Machine Shop	3
MAC 102	Print Reading for Machinists	3
MAC 203	Introduction to CNC Operations	6
MAT 108	Technical Mathematics	4
	Subtotal	17
Second Semester		
MAC 250	Advanced Inspection Techniques	3
MAC 201	Introduction to CNC Turning Operations	3
MAC 205	Introduction to CNC Milling Operations	3
	Subtotal	9
	Total Credits	26

CNC Machine Tool Operator

The computer numeric control (CNC) machine tool operator certificate prepares you with the job-entry skills necessary to perform most operations on the vertical mill, horizontal mill, lathe, grinder/shaper, CNC mill and CNC lathe. You will be prepared to enter positions as a CNC machine tool operator. All credits within this certificate apply toward the Associate of Applied Science in machining technologies degree with an emphasis in CNC machining technologies manufacturing.

PROGRAM ADMISSION REQUIREMENTS
Meet minimum assessment scores or prerequisites required for general education courses in the program. You may take individual courses, if the course prerequisites are met, prior to being accepted into this program.

COURSE MAP

Course	Title	Credits
First Semester		
MAC 100	Machine Shop Safety	1
MAC 101	Introduction to Machine Shop	3
MAC 102	Print Reading for Machinists	3
MAC 203	Introduction to CNC Operations	6
MAT 108	Technical Mathematics	4
	Subtotal	17
Second Semester		
MAC 250	Advanced Inspection Techniques	3
CIS 118	Introduction to PC Applications	3
MAC 201	Introduction to CNC Turning Operations	3
MAC 205	Introduction to CNC Milling Operations	3
	Subtotal	12
Third Semester		
MAC 145	Production Manufacturing Concepts	3
MAC 202	CNC Turning Operations II	3
MAC 240	CAD/CAM 2D	3
MAC 206	CNC Milling Operations II	3
	Subtotal	12
	Total Credits	41

Industrial Maintenance Technologies

This certificate is designed to provide a rounded understanding of the entry-level skills in computer aided drafting, machining and welding. This set of skills will allow you to enter the field of manufacturing equipment servicing and repair.

PROGRAM ADMISSION REQUIREMENTS

Meet minimum assessment scores or prerequisites required for general education courses in the program. You may take individual courses, if the course prerequisites are met, prior to being accepted into this program.

COURSE MAP

Course	Title	Credits
First Semester		
MAC 100	Machine Shop Safety	1
MAC 101	Introduction to Machine Shop	3
MAC 102	Print Reading for Machinists	3
MAC 110	Introduction to Engine Lathe	3
MAC 120	Introduction to Milling Machine	3
MAT 108	Technical Mathematics	4
	Subtotal	17
Second Semester		
CAD 101	Computer Aided Drafting I	3
CAD 102	Computer Aided Drafting II	3
CAD 240	Inventor I/Autodesk	3
CIS 118	Introduction to PC Applications	3
	Subtotal	12
Third Semester		
WEL 101	Allied Cutting Processes	4
WEL 102	Oxyacetylene Joining Processes	4
WEL 103	Basic Shielded Metal Arc I	4
	Subtotal	12
	Total Credits	41

Multi-Axis Lathe

This certificate is not eligible for federal student aid

This certificate will teach you the set-up, operation and programming of multi-axis lathes. You will work with live-tooling and dual-spindles to program and manufacture one-off parts. This is an advanced program meant for Associate of Applied Science degree graduates or for incumbent employees with advanced computer numerical control (CNC) skills and advanced programming experience.

PROGRAM ADMISSION REQUIREMENTS

To enter this certificate program, you must have completed the machining technologies A.A.S. degree within the past five years, have prior CNC programming experience, minimum testing scores, and employer references.

COURSE MAP

Code	Title	Credits
MAC 262	Introduction to Multi-Axis Lathe	2
MAC 263	Multi-Axis Lathe Operation	3
MAC 264	Multi-Axis Lathe Programming	3
Total Credits		8

CNC Wire EDM

This certificate is not eligible for federal student aid

This certificate program will instruct a student in the basics of CNC wire EDM set-up, programming and controller operations. This course of study is an advanced program meant for machining technologies Associate of Applied Science (A.A.S.) degree graduates or for incumbent employees with advanced CNC skills and programming experience.

PROGRAM ADMISSION REQUIREMENTS

To enter this certificate program, you must have completed the machining technologies A.A.S. degree within the past five years, have prior CNC programming experience, minimum testing scores, and employer references.

COURSE MAP

Code	Title	Credits
MAC 251	Introduction to Wire EDM	2
MAC 253	Wire EDM Operation	3
MAC 257	Wire EDM Programming	3
Total Credits		8

Five-Axis Milling Machine Certificate

This certificate is not eligible for federal student aid

This certificate prepares you to be able to set-up, operate and program five-axis milling machines. You will become familiar with tool management, pallet changers and lights-out manufacturing. This course of study is an advanced program meant for machining technologies Associate of Applied Science (A.A.S.) degree graduates or for incumbent employees with advanced CNC skills and advanced programming experience.

PROGRAM ADMISSION REQUIREMENTS

To enter this certificate program, you must have completed the machining technologies A.A.S. degree within the past five years, have prior CNC programming experience, minimum testing scores, and employer references.

COURSE MAP

Code	Title	Credits
MAC 259	Introduction to the 5-Axis Milling Machine	2
MAC 260	5-Axis Milling Machine Operation	3
MAC 261	5-Axis Milling Machine Programming	3
Total Credits		8