

# MACHINE TECHNOLOGIES

- CNC Manufacturing AAS Degree
- CNC Management AAS Degree

## Associate of Applied Science Degrees in Machine Technologies

CCD Manufacturing Center

### CNC Manufacturing AAS Degree

This program prepares students 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

Meet 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. Students may take individual courses, if the course prerequisites are met, prior to being accepted into this program.

### Requirements

Course	Title	Credits
<b>First Semester</b>		
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
<b>Second Semester</b>		
CAD 101	Computer Aided Drafting I	3
CIS 118	Introduction to PC Applications	3
ENG 121 or ENG 131	English Composition I : GT-CO1 or Technical Writing I	3
MAC 111	Intermediate Engine Lathe	3
MAC 121	Intermediate Milling Machine	3
Subtotal		15
<b>Third Semester</b>		
COM 115	Public Speaking	3
MAC 145	Production Manufacturing Concepts	3
MAC 201	Introduction to CNC Turning Operations	3
MAC 205	Introduction to CNC Milling Operations	3
MAC 240	CAD/CAM 2D	3
Subtotal		15
<b>Fourth Semester</b>		
MAC 220	Modern Production Manufacturing	3
MAC 245	CAD/CAM 3D	3
MAC 250	Advanced Inspection Techniques	3
MAC 252	Practical Metallurgy	3
POS 105 or SOC 101	Intro to Political Science: GT-SS1 or Introduction to Sociology I: GT-SS3	3
Subtotal		15
Total Credits		62

### CNC Management AAS Degree

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

### Program Admission Requirements

Meet 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. Students may take individual

courses, if the course prerequisites are met, prior to being accepted into this program.

### Requirements

Course	Title	Credits
<b>First Semester</b>		
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
<b>Second Semester</b>		
CAD 101	Computer Aided Drafting I	3
CIS 118	Introduction to PC Applications	3
ENG 121 or ENG 131	English Composition I : GT-CO1 or Technical Writing I	3
MAC 111	Intermediate Engine Lathe	3
MAC 121	Intermediate Milling Machine	3
Subtotal		15
<b>Third Semester</b>		
COM 115	Public Speaking	3
MAC 145	Production Manufacturing Concepts	3
MAC 201	Introduction to CNC Turning Operations	3
MAC 205	Introduction to CNC Milling Operations	3
MAC 240	CAD/CAM 2D	3
Subtotal		15
<b>Fourth Semester</b>		
MAC 220	Modern Production Manufacturing	3
MAC 250	Advanced Inspection Techniques	3
MTE 230	Design for Manufacturability	3
MTE 244	Lean Manufacturing - Practices & Processes	3
POS 105 or SOC 101	Intro to Political Science: GT-SS1 or Introduction to Sociology I: GT-SS3	3
Subtotal		15
Total Credits		62

## Certificate in Machine Technologies

CCD Manufacturing Center

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

### Basic Machining Certificate

This program will instruct students in the basics of shop safety, drill presses, saws, engine lathes, milling machines, measuring instruments, and basic drafting. 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. Students may take individual courses, if the course prerequisites are met, prior to being accepted into this program.

### Requirements

Course	Title	Credits
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 111	Intermediate Engine Lathe	3
MAC 120	Introduction to Milling Machine	3
MAC 121	Intermediate Milling Machine	3
MAT 108	Technical Mathematics	4
Total Credits		23

See gainful employment information for this certificate.

Learn more about gainful employment.

### Intermediate Machining Certificate

This program prepares students 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. Students may take individual courses, if the course prerequisites are met, prior to being accepted into this program.

#### Requirements

Course	Title	Credits
<b>First Semester</b>		
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
MAT 108	Technical Mathematics	4
Subtotal		14
<b>Second Semester</b>		
MAC 111	Intermediate Engine Lathe	3
MAC 120	Introduction to Milling Machine	3
MAC 121	Intermediate Milling Machine	3
MAC 201	Introduction to CNC Turning Operations	3
MAC 205	Introduction to CNC Milling Operations	3
Subtotal		15
Total Credits		29

See gainful employment information for this certificate.

Learn more about gainful employment.

### CNC Machine Tool Operator Certificate

Computer Numeric Control (CNC) Machine Tool Operator is a program that prepares students with the job-entry skills necessary to perform most operations on the vertical mill, horizontal mill, lathe, grinder/shaper, CNC mill, and CNC lathe. Graduates are prepared to enter positions as CNC Machine Tool Operators. All program credits apply toward the AAS Machining Technologies Degree with an emphasis in either CNC Machining Technologies Manufacturing or Management.

#### Program Admission Requirements

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

#### Requirements

Course	Title	Credits
<b>First Semester</b>		
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
<b>Second Semester</b>		
CAD 101	Computer Aided Drafting I	3

CIS 118	Introduction to PC Applications	3
MAC 111	Intermediate Engine Lathe	3
MAC 121	Intermediate Milling Machine	3
Subtotal		12

#### Third Semester

MAC 145	Production Manufacturing Concepts	3
MAC 201	Introduction to CNC Turning Operations	3
MAC 205	Introduction to CNC Milling Operations	3
MAC 240	CAD/CAM 2D	3
Subtotal		12
Total Credits		41

#### Optional

MAC 178	Machining Workshop	1-6
MAC 245	CAD/CAM 3D	3
MAC 246	CAD/CAM 3D Lab	3

See gainful employment information for this certificate.

Learn more about gainful employment.

### Industrial Maintenance Technologies Certificate

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 would allow a student 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. Students may take individual courses, if the course prerequisites are met, prior to being accepted into this program.

#### Requirements

Course	Title	Credits
<b>First Semester</b>		
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
<b>Second Semester</b>		
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
<b>Third Semester</b>		
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

See gainful employment information for this certificate.

Learn more about gainful employment.

### Multi Axis Lathe CERTIFICATE

\*\*This certificate is not eligible for federal student aid\*\*

This program is designed to instruct students in the set-up, operation, and programming of multi axis lathes. The student will work with live-tooling and dual-spindles to program and manufacture one-off parts. This course of study is an advanced program meant for Machining Technologies AAS degree graduates or for incumbent employees with advanced CNC skills and advanced programming experience.

**Program Admission Requirements**

Completion of a Machining Technologies degree within the past 5 years.  
Minimum work history requirements, prior CNC programming experience,  
minimum testing scores, and employer references.

**Requirements**

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 CERTIFICATE**

\*\*This certificate is not eligible for federal student aid\*\*

This 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 AAS degree graduates or for incumbent employees with advanced CNC skills and programming experience.

**PROGRAM ADMISSION REQUIREMENTS**

Completion of a Machining Technologies degree within the past 5 years.  
Minimum work history requirements, prior CNC programming experience,  
minimum testing scores, and employer references.

**REQUIREMENTS**

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\*\*

Upon completion of this program a student will be able to set-up, operate and program five-axis milling machines. The student will be familiar with tool management, pallet changers, and lights-out manufacturing. This course of study is an advanced program meant for Machining Technologies AAS degree graduates or for incumbent employees with advanced CNC skills and advanced programming experience.

**PROGRAM ADMISSION REQUIREMENTS**

Completion of a Machining Technologies degree within the past 5 years.  
Minimum work history requirements, prior CNC programming experience,  
minimum testing scores, and employer references.

**REQUIREMENTS**

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