

CNC Specialist Certificate

Program Number: 90-420-1

Certificate

Manufacturing Program Cluster

School of Applied Technology

Program offered at Madison Campuses

For information call: (608) 246-6102 or
(800) 322-6282 Ext. 6102

About the Certificate

Madison Area Technical College is now offering a Computer Numerical Control (CNC) Specialist certificate. This certificate is perfect for the student who already has manual machining skills, the ability to perform shop measurements and the ability to read prints. Four thousand (4,000) hours of industrial machining experience is required.

Certificate Application Process

To apply, see: Apply Online (on the Madison College website). [Create an ApplyWeb account](#) and follow the [instructions](#) to complete the [Online Certificate Application](#) before the [application deadline](#). Submit the \$15 non-refundable fee (payable by credit card, debit card or electronic check) with your application. Applicants may submit more than one certificate application per term using the Online Certificate Application; the same fees apply for each additional application.

Unique Requirements for Completion

The certificate will be awarded upon completion of the requirements with a minimum of a 2.0 grade average. The certificate will be awarded when completion of all requirements is verified after the semester the last course has been completed.

Curriculum

Courses	Credits	Hrs/week
32-420-346 Intro to CNC – G-code Programming ^o	2	3-1
32-420-337 Manufacturing w/Solid Modeling - 2D [♦]	2	4-0
32-420-348 Applied CNC - Conversational & Setup [♦]	2	1-3
32-420-336 Manufacturing w/Solid Modeling – 3D ^o	2	4-0
32-420-389 Applied CNC - Intermediate Operations ^o	2	1-3
32-420-370 Manufacturing w/Solid Modeling - Advanced [♦]	1	2-0
32-420-391 <u>Applied CNC - Advanced Operations[♦]</u>	<u>1</u>	<u>0-2</u>
Total	12	

^o Fall course offering

[♦] Spring course offering

Note:

Courses are listed in suggested sequence. Enrollment for courses adhere to course pre-requisites and co-requisites as indicated at the end of each course description.

Career Potential:

- CNC Machinist
- CNC Programmer
- Prototype Machinist
- CNC Set-Up
- CNC Coordinator
- CNC Lead Worker
- CNC Apprentice

More detailed and updated information on this program may be available at: madisoncollege.org. The college reserves the right to make changes in the regulations and courses announced in this publication without notice.

Madison Area Technical College provides equal opportunity in education and employment.

Rev. 03/12

Courses

32-420-336 Manufacturing w/Solid Modeling--3D 2 credits
This course builds on the concepts learned in Manufacturing w Solid Modeling--2D. Learners will utilize Solid Modeling software and CAM software to create true 3D models with surfacing concepts. Students will gain competency in file management by saving, converting, and working with different file types. Learners will create geometry in each application and convert files between CAD and CAM. Students will apply various tool paths theories to the designs they have created. Such theories include Surfacing, High Speed Machining, Hard Milling/Turning, 2 and 4 Axis Wire, Live lathe tooling and 4 Axis milling. Pre-req: 32-420-337 Manufacturing w/Solid Modeling--2D, 32-420-346 Intro to CNC—G-code Programming, 32-420-389 Applied CNC—Conversational & Setup. Co- reqs: 32-420-391 Applied CNC—Intermediate Operations

32-420-337 Manufacturing w/Solid Modeling--2D 2 credits
This course offers instruction on individual computer workstations in a computer lab. This computer-aided drafting (CAD) instruction uses Solid Modeling software that is capable of creating 3D models and manufacturing drawings. In this course you will spend half of the time creating 3D models using 2 and 2.5D features while exploring the concepts of working in 3D space. Once the solid models are created students will import the solid models into CAM (Computer-aided manufacturing) software and utilize machining concepts to produce manufactured part using 2.5D programming methods such as pocketing, contouring & drilling for milling machines as well as turning, facing, grooving and threading for turning centers. Pre-reqs- Intro to CNC—G-code Programming (346), Co-Applied CNC—Conversational & Setup

32-420-346 Intro to CNC –G-code Programming 2 credits
Hands-on and lecture course exposing students to CNC (Computer Numerical Control). Emphasizes CNC vertical milling machines and CNC turning centers. Covers history, basic CNC understanding and beginning programming including G-codes, M-codes. Students will utilize simulation software that will verify manually written code. Co-req of 32-420-322 or admission to certificate.

32-420-348 Applied CNC – Conversational & Setup 2 credits
This introductory Applications class familiarizes students with the basic setup procedures of CNC milling machines and CNC turning centers. They will set up rough stock and execute existing programs to produce finished parts. Once students learn these concepts they utilize the conversational programming software on the various CNC machines to program and produce parts. Pre-reqs: 32-420-346 Intro to CNC—G-code Programming and co-req of 42-420-377 Co-Manufacturing w/Solid Modeling--2D.

32-420-370 Manufacturing w/Solid Modeling--Advanced 1 credit
The advanced course requires students to draw complex solid models utilizing CAD software. These Models will then be imported into CAM software to use advanced programming methods to produce high quality parts. Mill Programming will include 2D, 2.5D, 3D, 4-Axis and an introduction to 5 Axis and 3+2 techniques. Lathe programming will include advanced turning and live tooling. Pre-reqs: 32-420-337 Manufacturing w/Solid Modeling--2D, 32-420-336 Manufacturing w/Solid Modeling--3D, 32-420-346 Intro to CNC—G-code Programming, 32-420-348 Applied CNC—Conversational & Setup. Coreq: 32-420-391 Applied CNC—Advanced Operations

32-420-389 Applied CNC – Intermediate Operations 2 credits
This applications class builds on CNC concepts learned in previous classes. Emphasis is on CNC Turning Center, CNC Milling machine, and CNC Wire set up and operation. Students will produce parts that they have modeled and programmed in Manufacturing w/Solid Modeling 1 and 2 as well as instructor provided programs. Pre-req: 32-420-337 Manufacturing w/Solid Modeling--2D, 32-420-346 Intro to CNC—G-code Programming, 32-420-348 Applied CNC—Conversational & Setup. Co-req: 32-420-336 Manufacturing w/Solid Modeling--3D.

32-420-391 Applied CNC – Advanced Operations 1 credit
Our most advanced CNC applications course devoted to machining complex toolpaths, including mold cavities and graphite electrodes. Stresses hands-on instruction and operation of CNC turning centers, vertical milling machines, machining centers. Pre-reqs: 32-420-337 Manufacturing w/Solid Modeling--2D, 32-420-336 Manufacturing w/Solid Modeling--3D, 32-420-346 Intro to CNC—G-code Programming, 32-420-348 Applied CNC—Conversational & Setup. Coreq: 32-420-370 Manufacturing w/Solid Modeling—Advanced