

Computer Numerical Control Programming

Degree Type

Certificate

Type

Career

Division of STEAM

Associate Dean: Bradley Cole

This certificate is designed to prepare students for a position operating or writing coded instructions (programs) for automated computer numerically controlled (CNC) machines. Programming is done both by hand and with the use of PC based automatic programming (Mastercam) software. CNC programs are written in both standard M & G code and conversational formats. Machining experience is acquired through the operation of both CNC machining centers and conventional machine tools, which include two vertical and one horizontal machining centers (two of which are equipped with automatic tool changers), and an array of standard milling, grinding, and turning machines (some of which are equipped with state-of-the-art digital readout systems). Inspection devices used include optical comparators, coordinate measuring machines, digital height gauges, as well as other traditional measuring tools. Students with experience in the machine trades or other technical occupations may qualify for some credit through challenge examinations. They should discuss this with their faculty advisor.

Graduates will be able to:

- Have the tools necessary to program in both a production and tool-shop environment;
- Generate CNC code by both manual and computer-assisted methods;
- Understand the aspects of machine programs, tooling and first piece inspection, and state-of-the-art software and hardware systems.

While not a program requirement, students must demonstrate the writing skills necessary to enter ENGL 1010 in order to graduate from this program. Based on assessment, students might be required to take developmental English to fulfill this requirement. High school or equivalent preparation is required; it is also recommended that students have at least the equivalent of two years mathematics including algebra and either geometry or intermediate algebra. Some required classes are held at off-site locations evenings and weekends. Students must provide their own transportation.

Program Requirements

Item #	Title	Credits
MACH 1040	Precision Machining I	5
MECH 1560	CNC Programming	3
MACH 2400	CNC Machining	5
MACH 2410	Tooling Technology	4
MECH 1570	Dimensional Metrology	3
MECH 1050	Engineering Graphics I	3
CADD 1700	Computer Aided Drafting I	3
MATH 1230	Elements of Applied Mathematics I	3
MATH 1240	Elements of Applied Math II	3
Total Credits		32

Course Sequencing

First Semester

Intended as a guide for academic planning. It need not be followed exactly or completed in four semesters.

Item #	Title	Credits
MACH 1040	Precision Machining I	5
MATH 1230	Elements of Applied Mathematics I	3

Second Semester

Item #	Title	Credits
MECH 1050	Engineering Graphics I	3
MATH 1240	Elements of Applied Math II	3
MECH 1560	CNC Programming	3

Third Semester

Item #	Title	Credits
MACH 2400	CNC Machining	5
CADD 1700	Computer Aided Drafting I	3

Fourth Semester

Item #	Title	Credits
MACH 2410	Tooling Technology	4
MECH 1570	Dimensional Metrology	3

Footnotes

*Based on placement, students may be required to take MATH 0960, before taking math credit courses.

*29 of the 32 credit hours of this program apply towards the specific 64 credit requirement of the Machine Tool Technology A.A.S. program allowing a student the opportunity to apply the credits earned in the certificate towards the completion of a two-year degree.

*18 of the 32 credit hours of this program apply towards the specific 64 credit requirement of the Mechanical Technology: CAD Design A.A.S. program allowing a student the opportunity to apply the credits earned in the certificate towards the completion of a two-year degree.