



Numerical Control Programming

Certificate, Career program

Division of Math, Physics, Technology & Engineering Science, Associate Dean: Bradley Cole
 Department Chair: John Longwell

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 of this rigorous and intensive program 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 may need to successfully complete ENGL 0950 to fulfill this requirement.

While no specific high school preparation is required, it is recommended that students have at least the equivalent of two years mathematics including algebra and either geometry or intermediate algebra.

Program Requirements

Precision Machining I (MACH 1040)	5
CNC Programming (MECH 1560)	3
CNC Machining (MACH 2400)	5
Tooling Technology (MACH 2410)	4
Dimensional Metrology (MECH 1570)	3
Engineering Graphics I (MECH 1050)	3
Computer Aided Drafting I (CADD 1700)	3
Mathematics (MATH 1230-1240 or higher)*	6
Total hours	32

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

<i>Sample Sequence: intended as a guide for academic planning. It need not be followed exactly or completed in four semesters.</i>			
<i>First Semester</i>		<i>Second Semester</i>	
Precision Machining (MACH 1040)	5	CNC Programming (MECH 1560)	3
Mathematics (MATH 1230)	3	Mathematics (MATH 1240)	3
		Engineering Graphics I (MECH 1050)	3
<i>Third Semester</i>		<i>Fourth Semester</i>	
CNC Machining (MACH 2400)	5	Tooling Technology (MACH 2410)	4
Computer Aided Drafting I (CADD 1700)	3	Dimensional Metrology (MECH 1570)	3