

MANUFACTURING TECHNOLOGY A.A.S.

60 Semester Credit Hours; Curriculum: 0274

This degree prepares students for technical positions in modern manufacturing production and engineering design. The curriculum focuses on preparing the student for job positions in the CNC setup and programming, machine maintenance, manufacturing engineering, and product and fixture design.

Note: Refer to IAI General Education Courses page for guidelines on General Education course selection.

Code	Title	Hours
General Education Requirements		
<i>Area A — Communications</i>		
EGL 101	Composition I	3
Select one of the following:		3
EGL 102	Composition II	
EGL 111	Introduction to Business and Technical Writing (recommended)	
EGL 212	Technical Writing Applications (recommended)	
SPE 103	Effective Speech	
<i>Area B — Mathematics</i>		
Select one course from Area B		3-4
MAT 114	Applied Mathematics I (recommended)	
<i>Area C — Science</i>		
No course required		0-3
PHY 101	Applied Physics (recommended)	
<i>Area D — Social and Behavioral Sciences</i>		
Select one course from a social or behavioral science discipline		3
<i>Area E — Humanities/Fine Arts</i>		
Select one course from a humanities or fine arts discipline		3
<i>Area F — Global Studies¹</i>		
Select one course that satisfies Global Studies requirement		0-3
<i>Area G — U.S. Diversity Studies²</i>		
Select one course that satisfies U.S. Diversity Studies requirement		0-3
Total Hours		15

¹ Students may take a Global Studies course that satisfies both Area F and another Area requirement.

² Students may take a U.S. Diversity course that satisfies both Area G and another Area requirement.

Code	Title	Hours
Major Requirements		
CAD 116	Basic AutoCAD	3
MFG 110	Introduction to Machining	3
ELT 101	Introduction to Electronics	5
MFG 102	Industrial Drafting and Design	3
MFG 135	Hydraulics, Pneumatics and Controls	3
MFG 140	Introduction to Robotics and Vision Systems	4
MFG 141	CNC Machine Operation - NIMS Test Preparation	4
MFG 144	Introduction to CNC Programming	4

MFG 165	Mastercam Computer Aided Manufacturing	4
MFG 240	Programmable Logic Controllers (PLC)	4
or MFG 245	Programmable Automation Controllers (PAC)	
Select one of the following:		4
MFG 145	Advanced CNC Programming	
MFG 166	MASTERCAM Computer Aided Manufacturing II	
MFG 250	Advanced Automation Applications (PLC/PAC/HMI)	
Select additional MFG courses to total at least four credit hours		4
Total Hours		45

Program Learning Outcomes

1. Evaluate manufacturing assignment based on critical thinking and problem solving skills. Become a good communicator and effective team member.
2. Create and prove "G" code programs to machine parts on a CNC turning center and a CNC milling center that meet the part specification,
3. Design, build, and troubleshoot hydraulic or pneumatic powered machine, based on basic physics principals that apply to fluid power.
4. Rate an industrial process to decide if it qualifies as an automation or robotic work cell based on principles of Computer Integrated Manufacturing,
5. Compose state diagrams based on machine mechanisms and operating sequences, flow charts, and PLC ladder programs that meet OSHA safety requirements,
6. Choose an industrial machine operation or manufacturing process instruction manual for operators and maintenance personnel.
7. Prepare basic CAD schematics and drawings for electrical control, fluid power, PLC and I/O wiring, and mechanical systems.

Manufacturing Technology A.A.S. Pathway

The following Pathway is recommended for students pursuing an Associate in Applied Science degree in Manufacturing Technology. For more information or program specific advising contact the Department Chair or Program Coordinator. **General Education courses should be selected from the list of IAI General Education Courses.**

Course	Title	Hours
First Year		
Fall Semester		
EGL 101	Composition I	3
MAT 114	Applied Mathematics I	4
CAD 116	Basic AutoCAD	3
MFG 102	Industrial Drafting and Design	3
MFG 110	Introduction to Machining	3
		Hours
		16
Spring Semester		
Select one of the following:		3
EGL 102	Composition II	
EGL 111	Introduction to Business and Technical Writing	
EGL 212	Technical Writing Applications	
SPE 103	Effective Speech	
ELT 101	Introduction to Electronics	5
MFG 135	Hydraulics, Pneumatics and Controls	3
MFG 141	CNC Machine Operation - NIMS Test Preparation	4
		Hours
		15

Second Year**Fall Semester**

MFG 140	Introduction to Robotics and Vision Systems	4
MFG 144	Introduction to CNC Programming	4
MFG 165	Mastercam Computer Aided Manufacturing	4
Select one of the following:		4
MFG 240	Programmable Logic Controllers (PLC)	
MFG 245	Programmable Automation Controllers (PAC)	
Hours		16

Spring Semester

Select one of the following:		4
MFG 145	Advanced CNC Programming	
MFG 166	MASTERCAM Computer Aided Manufacturing II	
MFG 250	Advanced Automation Applications (PLC/PAC/HMI)	
Select one Social and Behavioral Sciences course that also satisfies Global Studies ¹ or U.S. Diversity Studies ² requirement		3
Select one Humanities/Fine Arts course that also satisfies Global Studies ¹ or U.S. Diversity Studies ² requirement		3
Select one additional MFG course		4
Hours		14
Total Hours		61

¹ At least one Global Studies course is required for degree completion.

² At least one U.S. Diversity Studies course is required for degree completion.

Note: Pathway is a recommended sequence of courses. Part-time students should contact the program coordinator to discuss a part-time pathway as well as course prerequisites and recommendations.