

ADVANCED MANUFACTURING A.A.S.

60 Semester Credit Hours; Curriculum: 0274

Advanced Manufacturing degree is designed to prepare students for positions in modern manufacturing. Program teaches comprehensive set of skills including occupational safety, technical print reading, precision machining, manufacturing processes, fluid power, and machine controls. Students will learn to operate, setup, program, and troubleshoot high-tech production equipment including CNC machine centers and industrial robotics.

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 Studies course that satisfies both Area G and another Area requirement.

Code	Title	Hours
Major Requirements		
MFG 101	Occupational Safety	2
MFG 102	Industrial Drafting and Design	3
MFG 110	Introduction to Machining	3
MFG 111	Introduction to Computer Integrated Manufacturing (CIM)	3
MFG 135	Fluid Power and Controls	4

MFG 141	CNC Machine Operation - NIMS	4
MFG 144	Introduction to CNC Programming	4
MFG 165	Mastercam (CAM)	4
MFG 210	Industrial Robotics and Automation	4
MFG 240	Programmable Logic Controllers (PLC)	4
Select one of the following:		4
MFG 145	Advanced CNC Programming	
MFG 166	Advanced Mastercam	
MFG 245	Programmable Automation Controllers (PAC)	
Select additional courses to total a minimum of 6 credit hours:		6
MEC 105	Processes and Materials	
MFG 120	Introduction to Welding	
MFG 125	Advanced Welding	
MFG 142	CNC Setup and Operations	
MFG 170	Automation Equipment Maintenance	
MFG 250	Advanced Automation Controllers	

Total Hours **45**

Advanced Manufacturing A.A.S. Pathway

The following Pathway is recommended for students pursuing an Associate in Applied Science degree in Advanced Manufacturing. 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.**

First Year		Hours
Fall Semester		
EGL 101	Composition I	3
MAT 114	Applied Mathematics I (recommended)	4
MFG 101	Occupational Safety	2
MFG 102	Industrial Drafting and Design	3
MFG 111	Introduction to Computer Integrated Manufacturing (CIM)	3
Hours		15
Spring Semester		
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	
MFG 110	Introduction to Machining	3
MFG 135	Fluid Power and Controls	4
MFG 141	CNC Machine Operation - NIMS	4
Hours		14

Second Year		Hours
Fall Semester		
MFG 144	Introduction to CNC Programming	4
MFG 165	Mastercam (CAM)	4
MFG 210	Industrial Robotics and Automation	4
MFG 240	Programmable Logic Controllers (PLC)	4
Hours		16
Spring Semester		
Select one of the following:		4
MFG 145	Advanced CNC Programming	
MFG 166	Advanced Mastercam	
MFG 245	Programmable Automation Controllers (PAC)	
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 two additional courses to total a minimum of 6 credit hours	6-8
MEC 105	Processes and Materials
MFG 120	Introduction to Welding
MFG 125	Advanced Welding
MFG 142	CNC Setup and Operations
MFG 170	Automation Equipment Maintenance
MFG 250	Advanced Automation Controllers
Hours	16-18
Total Hours	61-63

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.

Program Learning Outcomes

1. Apply OSHA safety procedures related to various manufacturing operations.
2. Describe common materials, tools, and fixtures used in modern manufacturing.
3. Analyze technical drawings and propose best industrial process based on requirements.
4. Discuss and demonstrate correct setup and operation of CNC lathe and mill machines.
5. Create complex CNC programs to control CNC Turning Center and CNC Milling Center.
6. Justify integration of CNC, fluid power, robotics, and PLC to automate manufacturing processes.
7. Propose best solution for manufacturing projects using critical thinking and communication skills.