ADVANCED MANUFACTURING CERTIFICATE

37 Semester Credit Hours; Curriculum: 0271

Advanced certificate prepares students for positions in modern production and precision machining. Program offers broad range of skills from occupational safety, technical print reading, precision machining, and manufacturing processes to fluid power, welding, and machine controls. Students will learn to operate, setup, and program high-tech production equipment including CNC machine centers and industrial robotics.

Code	Title	Hours
Courses for a Certificate		
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
or MFG 165	Mastercam (CAM)	
MFG 210	Industrial Robotics and Automation	4
MFG 240	Programmable Logic Controllers (PLC)	4
Select two of the following:		6
MFG 120	Introduction to Welding	
MFG 125	Advanced Welding	
MFG 170	Automation Equipment Maintenance	
MFG 245	Programmable Automation Controllers (PAC)	
MFG 250	Advanced Automation Controllers	
Total Hours		**37**

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.

Advanced Manufacturing Certificate Pathway

The following Pathway is recommended for students pursuing the Advanced Manufacturing Certificate.

Course	Title	Hours
First Year		
Semester One (Fall)		
MFG 101	Occupational Safety	2
MFG 110	Introduction to Machining	3
MFG 111	Introduction to Computer Integrated Manufacturing (CIM)	3
MFG 240	Programmable Logic Controllers (PLC)	4
	Hours	**12**
Semester Two (Spring)		
MFG 102	Industrial Drafting and Design	3
MFG 135	Fluid Power and Controls	4
MFG 141	CNC Machine Operation - NIMS	4
Select one of the following:		3-4
MFG 120	Introduction to Welding	
MFG 125	Advanced Welding	
MFG 170	Automation Equipment Maintenance	
MFG 245	Programmable Automation Controllers (PAC)	
	Hours	**14-15**
Second Year		
Semester One (Fall)		
MFG 144	Introduction to CNC Programming	4
or MFG 165	or Mastercam (CAM)	
MFG 210	Industrial Robotics and Automation	4
Select one of the following:		3-4
MFG 120	Introduction to Welding	
MFG 125	Advanced Welding	
MFG 170	Automation Equipment Maintenance	
MFG 245	Programmable Automation Controllers (PAC)	
MFG 250	Advanced Automation Controllers	
	Hours	**11-12**
	Total Hours	**37-39**

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