

# ADVANCED MANUFACTURING AUTOMATION CERTIFICATE

37 Semester Credit Hours; Curriculum: 0271

Advanced certificate prepares students for various positions in modern manufacturing and automation. The curriculum develops a broad range of skills from occupational safety and technical print reading to fluid power and machine controls. Students will learn to safely operate, setup and program high-tech production equipment, including CNC machine centers and industrial robotics.

Code	Title	Hours
<b>Courses for a Certificate</b>		
CAD 101	Industrial Drafting and Design	4
MFG 101	Occupational Safety	2
MFG 111	Manufacturing Overview	3
or MFG 112	Automation Overview	
MFG 135	Fluid Power and Controls	4
MFG 141	CNC Machine Operation - NIMS	4
or MFG 142	CNC Setup and Operations	
MFG 170	Industrial Electronics	3
or MFG 180	Mechanical Drives	
MFG 210	Industrial Robotics and Automation	4
MFG 240	Programmable Controllers	4
Select three of the following:		9
CAD 230	Introduction to SolidWorks	
MFG 120	Introduction to Welding	
MFG 125	Advanced Welding	
MFG 220	Machine Vision Systems	
MFG 225	Motors and Controls	
MFG 245	Intermediate Programmable Controllers	
MFG 250	Advanced Programmable Controllers	
<b>Total Hours</b>		<b>37</b>

## Advanced Manufacturing Automation Certificate Pathway

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

<b>First Year</b>		
<b>Fall Semester</b>		<b>Hours</b>
MFG 101	Occupational Safety	2
MFG 111	Manufacturing Overview	3
or MFG 112	or Automation Overview	
MFG 240	Programmable Controllers	4
Select one of the following:		3
CAD 230	Introduction to SolidWorks	
MFG 120	Introduction to Welding	
MFG 225	Motors and Controls	
<b>Hours</b>		<b>12</b>
<b>Spring Semester</b>		
CAD 101	Industrial Drafting and Design	4
MFG 135	Fluid Power and Controls	4
MFG 210	Industrial Robotics and Automation	4
Select one of the following:		3-4

CAD 230	Introduction to SolidWorks	
MFG 125	Advanced Welding	
MFG 220	Machine Vision Systems	
MFG 245	Intermediate Programmable Controllers	
<b>Hours</b>		<b>15-16</b>
<b>Second Year</b>		
<b>Fall Semester</b>		
MFG 141	CNC Machine Operation - NIMS	4
or MFG 142	or CNC Setup and Operations	
MFG 170	Industrial Electronics	3
or MFG 180	or Mechanical Drives	
Select one of the following:		3-4
CAD 230	Introduction to SolidWorks	
MFG 120	Introduction to Welding	
MFG 225	Motors and Controls	
MFG 250	Advanced Programmable Controllers	
<b>Hours</b>		<b>10-11</b>
<b>Total Hours</b>		<b>37-39</b>

**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.

## 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. Demonstrate correct setup and safe operation of various fluid power circuits utilizing hydraulic and pneumatic trainers available in the lab.
5. Discuss and demonstrate correct setup and operation of CNC lathe and mill machines.
6. Justify integration of CNC, fluid power, robotics and PLC to automate manufacturing processes.