



Industrial Maintenance Cohort Program (Year 3-WF)

Title	Credits	Course	Schedule
Fluid Power 4	1	10-620-114	1 st Semester
PLC 2 (Siemens)	1	10-628-152	1 st Semester
PLC 3 (Siemens)	1	10-628-153	1 st Semester
Robotics 1	1	10-628-161	1 st Semester
Robotics 2	1	10-628-162	1 st Semester
PLC 4 (Siemens)	1	10-628-154	2 nd Semester
PLC 5 (Siemens)	1	10-628-155	2 nd Semester
Instrumentation and Process Control 1 (Siemens)	1	10-628-171	2 nd Semester
Instrumentation and Process Control 2 (Siemens)	1	10-628-172	2 nd Semester
Instrumentation and Process Control 3 (Siemens)	1	10-628-173	2 nd Semester
Blueprint Reading Fundamentals	CEU's	10-620-199	2 nd Semester
<i>Books and materials provided</i>	10		

Education Pathways (Year 1 + Year 2 + Year 3):

- 16 credits toward Industrial Maintenance Certificate (17 credits)
- 21 credits toward Industrial Maintenance Diploma (26 credits)
- 30 credits toward Electro-Mechanical Technology Associate Degree (60 credits)
- 29 credits toward Automated Manufacturing Systems Technology Associated Degree (60 credits)

Course Descriptions

Fluid Power 4

Provides an introduction to advanced fluid power systems. Students examine advanced components and controls within a fluid power system. Laboratory activities are performed to verify the theory.

Coreq: Fluid Power 3 (10620113)

PLC 2

Introduces Programmable Logic Controllers (PLC)s and Studio 5000 (formerly RSLogix5000) Programming Software. The PLC hardware will consist of Allen Bradley products. Students will configure Ethernet communications to connect to the Allen Bradley PLC hardware. Students will use Studio 5000 programming software to create logical solutions for real world applications. The applications will require students to create, download, and debug their programs. Students will study industrial sensors and their uses. Students will wire and test sensor operations. Coreq: Programmable Logic Controllers (10609173) OR PLC 1 (10628151)

PLC 3

Continues using the Allen Bradley PLC hardware platform with Studio 5000 programming software. Introduces Analog I/O and scaling for program interfacing. Scaling with math instructions, data handling with FIFO/LIFO instructions, and sequencer SQR/SQO instructions are all introduced. Coreq: PLC 2 (10628152)

Robotics 1

Introduces basic robotic programming techniques. Hands on experience will include safety, system setup, jogging, events, tools, coordinate systems, and robot movement types.

Robotics 2

Introduces advanced programming techniques. Hands on experience will include robotic input and output routines, program flow, variables/math instructions, offsets instructions, and operator communication instructions.

PLC 4

Introduces the IEC 61131-3 compatible languages within Studio 5000. Students are introduced to Structured Text (ST), Sequential Function Charts (SFC), and Function Block Diagrams (FBD). Additionally, students learn remote I/O. Coreq: PLC 3 (10628153)

PLC 5

Introduces motion programming within Studio 5000. Students will configure, tune, program, and troubleshoot a complete motion control system. The course will cover homing, moving, jogging, and coordinated axis instructions of a motion device. The course introduces advanced PLC to PLC communication, advanced data types, and using Add-On instructions. Coreq: PLC 4 (10628154)

Instrumentation and Process Control 1

Introduces Open Loop and Closed Loop control. Students learn about On/Off control, effects of deadband, and common manufacturing processes, which include Batch Processes and Continuous Processes.

Instrumentation and Process Control 2

Introduces Proportional Control using Proportional Band and Proportional Gain. Students apply calibration procedures to correct transmitter output signals, and interpret Piping and Instrumentation Diagrams.

Instrumentation and Process Control 3

Introduces Programmable Logic Controller (PLC) based Proportional Integral and Derivative (PID) Control. Students apply various tuning methods to control closed-loop processes, including flow, level and temperature.

Blueprint Reading Fundamentals

Introduces students to reading both electrical schematics and mechanical prints.