



Industrial Maintenance Cohort Program (Year 1)

| Title | Credits | Course | Semester |
|-------------------------------------|---------|------------|----------|
| College Tech Math 1A | 3 | 10-804-308 | 1 |
| DC Circuits 1 | 1 | 10-660-110 | 1 |
| DC Circuits 2 | 1 | 10-660-111 | 1 |
| Fluid Power 3 | 1 | 10-620-113 | 1 |
| Ladder Logic and Control Devices | 1 | 10-609-170 | 2 |
| Motor Drives 2 | 1 | 10-620-142 | 2 |
| DC Circuits 3 | 1 | 10-660-112 | 2 |
| AC Circuits 1 | 1 | 10-660-114 | 2 |
| System Troubleshooting | 1 | 10-620-188 | 2 |
| <i>Books and materials provided</i> | 11 | | |

Education Pathways:

- 11 credits Fundamentals of Industrial Maintenance Certificate (Completed)
- 9 credits toward Industrial Maintenance Certificate (17 credits)
- 11 credits toward Industrial Maintenance Diploma (26 credits)
- 11 credits toward Electro-Mechanical Technology Associate Degree (60 credits)
- 11 credits toward Automated Manufacturing Systems Technology Associated Degree (60 credits)

Course Descriptions

College Tech Math 1A

Included topics are solving linear equations; graphing; percent; proportions; measurement systems; computational geometry; and right triangle trigonometry. Emphasis will be on the application of skills to technical problems. Successful completion of College Technical Math 1A and College Technical Math 1B is the equivalent of College Technical Math 1.

DC Circuits I

Introduces electrical safety and program procedures. The course covers Ohm's Law, power law, series circuits, and voltmeter, ammeter and ohmmeter applications. Number powers, electronic notations, circuit component recognition and diagrams, resistor power ratings, color code, Kirchhoff's voltage law and atomic structure are also included. Corequisite: College Technical Math 1 (10-804-115) or College Technical Math IA (10-804-113) or Industrial Maintenance Math (31-804-308)

DC Circuits 2

Covers basic parallel and series-parallel circuits and their properties. Examines the theory, application and design of series-parallel circuits, such as loaded and unloaded voltage dividers and the Wheatstone bridge. Laboratory activities are performed to verify the theory. Corequisite: DC Circuits I (10-660-110)

DC Circuits 3

Covers capacitors and inductors including time constants and instantaneous voltage and current values of RC and RL circuits. Applications and various types of capacitors and inductors are discussed. Magnetism, electromagnetism, and devices, such as relays and solenoids, are also presented. Laboratory activities are performed to verify the theory. Corequisite: DC Circuits 2 (10-660-111)

AC Circuits 1

Covers AC waveforms and different voltage values including Peak, RMS, Average and Peak to Peak. The operation of transformers is also included. Laboratory activities using the oscilloscope are performed to verify the theory. Corequisite: DC Circuits 2 (10-660-111)

Ladder Logic and Control Devices

Introduces ladder logic diagrams used to document power control networks. Discrete industrial devices are also studied including switches, contactors, relays, timers, and motor starters. Students will design, construct, and troubleshoot ladder logic circuitry following safe working procedures. Students taking this course should have a working knowledge of DC and AC circuits.

Motors and Drives 2

Evaluates the operation of AC induction motors and drives. Theory and labs will include operational controls, characteristics, setup, wiring, controlling, troubleshooting and testing of both AC motors and drives. Prerequisite: DC Circuits 3 (10660113) and AC Circuits 1 (10660114)

Fluid Power 1

Provides an introduction to fundamental principles and laws of fluid power. Laboratory activities are performed to verify the theory. Coreq: College Technical Math 1 (10804115) OR College Algebra and Trigonometry with Apps (10804197) OR College Technical Math 1A (10804113) OR Industrial Maintenance Math (31804308)

System Troubleshooting

Develops troubleshooting skills by using several closed-loop systems on a level and flow process trainer. Students identify faults electrically inserted into this trainer by recognizing symptoms, creating and using flow charts for analysis, and finding the problem with test instruments. Corequisites: Ladder Logic and Control Devices (10-609470); Electrical Safety, Industry (10-609-101)