



Industrial Maintenance Cohort Year 1

Title	Credits	Course	Semester
College Tech Math 1A	3	10-804-113	1
DC Circuits 1	1	10-660-110	1
DC Circuits 2	1	10-660-111	1
Hydraulics 1	1	10-620-113	1
Ladder Logic & Control Devices	1	10-660-170	2
Motor and 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
Total	11		
<i>Books and materials provided</i>			

Education Pathways:

- 11 credits Fundamentals of Industrial Maintenance Certificate (Completed)
- 9 credits toward Industrial Maintenance Foundations Certificate (16 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 – Hydraulics 1 would be utilized as an elective credit)

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.

Prereq: Alg – HS GPA 2.75+ OR ACPL 51+, Next Gen 250+, ACT Math 18+ OR Alg Prep 10834109 OR Math & Logic 10804133 OR Not pursuing a degree.

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. Coreq: College Technical Math 1 (10804115) OR College Technical Math 1A (10804113) OR Industrial Maintenance Math (31804308) OR College Algebra and Trigonometry with Applications (10804197) OR Intermediate Algebra with Applications (10804118)

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.

Coreq: DC Circuits 1 (10660110)

Hydraulics 1

Introduces fundamental principles and laws of fluid power, with a focus on hydraulics. 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

Ladder Logic & Control Devices

Introduces hardwired components found in industrial applications used to control simple circuits. Students will learn about switches, relays, contactors, timers, and indicator lamps. Students will use their knowledge of these devices to wire various circuits. Students will use ladder logic diagrams to interconnect and label devices to make complete circuits.

Coreq: DC Circuits 1 (10660110)

Motors and Drives 2

Introduces AC Generators, Three Phase, and Single Phase motors. Starting methods for AC motors, including AC Drives, will be introduced. Control wiring and reversing circuits will also be introduced. Students will wire for Synchronous and Induction motor operation.

Coreq: Motors and Drives 1 (10620148)

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.

Coreq: DC Circuits 2 (10660111)

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.

Coreq: DC Circuits 3 (10660112) OR enrolled in the Manufacturing Engineering Tech program (106233) and Coreq: DC Circuits 2 (10660111)

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.

Coreq: Ladder Logic and Control Devices (10609170) OR Ladder Logic and Control Devices (10660170); AC Circuits 1 (10660114)