

Maintenance Technician Certificate

The Maintenance Technician pathway is for students who want to concentrate on the mechanical aspects of the contemporary industry. Courses in this program include Rigging/Robots Mechanical, Fanuc Robots and Mechanical systems which is the backbone of modern industry. This Program will induce the Maintenance Technician to Fluid Power and Pipefitting /Tube Bending skills that are needed in the maintenance field. The Maintenance Technician will also study Electrical Fundamentals and Motor Control along with PLC training for an overall knowledge of the Maintenance processes. These courses designed to provide students the needed expertise to install, troubleshoot and repair these essential mechanisms. Upon successful completion, a FANUC Handling Tool Operation and Programming certification will be issued.

Please note: The Manufacturing Essentials Program is a pre-requisite to entering this program. This pre-req may be waived based on experience or successful completion of a hands-on assessment in these areas. Assessment to be completed at the expense of the student.

Non-Credit Course Code	Course Title	Hours	Days
CELC 8013	Electrical Fundamentals	40	5
CELC 8012	Motor Controls & Drives	40	5
CMNF 8241	FANUC Robotics Operations	40	5
CMNF 8269	Fluid Power Fundamentals	40	5
CMNF 8296	Mechanical Teardown and Rigging	40	5
CMNF 8295	Mechanical Systems and Lubrication	40	5
CMNF 8247	Basic PLC	40	5
CMND 8240	Pipefitting & Tube Bending	40	5
CMNF 8276	Machine Tool	40	5
CMNF 8239	Automated Systems Troubleshooting	40	5
A certificate of completion will be awarded to students who successfully complete the above courses.		400 hours	50 days

Non-Credit Course Descriptions

Electrical Fundamentals – CELC 8013– 40 hours

Prerequisite: None

This forty (40) hour training course covers the basics of AC (Alternating Current) and DC (Direct Current) theory and fundamentals. The student will first gain an understanding of the concepts of electrical schematics, components, voltage, current and resistance. These fundamentals will then be applied through Ohm's Law to basic circuit design and analysis. Power, magnetism and DC generation will also be introduced to complete the theories of DC applications.

Motor Controls & Drives – CELC 8012 – 40 hours

Prerequisite: CELC 8013/Electrical Fundamentals

This forty (40) hour course is designed to provide the basic skills in AC / DC motors and motor controls. The course provides an understanding of the operation of AC and DC motors and motor control circuits. Course topics include AC / DC motor operations, control circuit components, motor control wiring, connections, ladder diagrams, and interpretation of electronic motor control schematics.

FANUC Robotics Operations – CMNF 8241 – 40 hours

Prerequisite: None

This forty (40) hour course is designed to provide the basic skills needed to operate and program FANUC robots. Course topics include robotic safety, controls, operations, and handling tool programming.

Fluid Power Fundamentals – CMNF 8269 - 40 hours

Prerequisite: *CMTH 8008/Shop Math*

This forty (40) hour course is designed to provide the basic skills in fluid power. This course provides an understanding of fluid power symbols, basic components of fluid power systems including basic laws and formulas for fluid power calculations. Course topics include pumps, control valves, actuators, and maintenance procedures of fluid power systems.

Mechanical Teardown and Rigging – CMNF 8296 – 40 hours

Prerequisite: *None*

This forty (40) hour course is designed to provide the detailed instructions and procedures necessary for complete disassembly, inspection, and reassembly of a FANUC robot mechanical unit. Also includes Rigging to provide an understanding of rigging safety and equipment used in rigging applications.

Mechanical Systems and Lubrication – CMNF 8295 – 40 hours

Prerequisite: *None*

This forty (40) hour course is designed to provide skills in mechanical power transmission systems. The course provides an understanding of mechanical systems and drives of power transmission mechanical equipment. Course topics include safety, chain drives, sprockets, belt drives, gears, motors, clutches, and couplings. This course will also cover lubrication. Participants will learn the importance of following lubrication schedules, how to handle and store lubricants to prevent contamination.

Basic PLC – CMNF 8247 – 40 hours

Prerequisite: *CELC 8013 Electrical Fundamentals and CELC 8012 Motor Controls & Drives*

This forty (40) hour course is designed to provide skills in programmable logic controllers (PLC) fundamentals. The course provides a general understanding of PLC hardware, applications, and logic. Course topics include PLC hardware, navigation of PLC controller software, use of simple logic instructions, and basic trouble-shooting.

Pipefitting & Tube Bending – CMNF 8240 – 40 hours

Prerequisite: *None*

This forty (40) hour course is designed to provide skills in pipefitting and tube bending. The course provides an understanding of piping drawings, component identification, and equipment used in pipefitting and tube bending applications. Course topics include pipefitting, methods of tube bending, pipe materials, joints, fittings, and pipe hangers and support applications.

Machine Tool – CMNF 8276 – 40 hours

Prerequisite: *CBPR 8013/Blueprint Reading, GD&T & Metrology and CMTH 8008/Shop Math*

This forty (40) hour course is designed to provide the skills in machine tool functions and applications. The course provides an understanding of operation of machine tool equipment including engine lathes, saws, drill press, milling, and basic power tools. Course topics include safety, speeds and feeds, engine lathe equipment operation, cutting tools, milling operation.

Automated Systems Troubleshooting – CMNF 8239 - 40 hours

Prerequisite: *CELC 8013/Electrical Fundamentals, CMNF 8241/FANUC Robotics Operations*

This forty (40) hour training course covers system level training and system integration fundamentals. Course topics include trouble-shooting programmable logic controllers (PLC's) integrated with electro-mechanical systems; Trouble-shooting integrated fluid power systems; Trouble-shooting integrated welding systems; Using electrical and fluid/pneumatic power schematics in trouble-shooting.

Optional Courses:

CMNF 8285	Intermediate PLC - 1	CMNF 8090	Robotics Electrical Troubleshooting & Maintenance
CMNF 8279	Intermediate PLC - 2	CMNF 8053	Hydraulics Fundamentals
CMNF 8280	Advanced PLC Maintenance and Troubleshooting	CMNF 8207	Pneumatics Fundamentals
CELC 8022	Electronic Sensors	CWET 8055	Soldering