Robot Technician Certificate

The Robotics Technician program combines robot programming and the technical skills needed to work in this field. This course introduces Programmable Logic Controllers (PLCs), Electrical Fundamentals, Robot Electrical Troubleshooting, and Motor Controls and Drives. The Robot Technician prepares you to enter the complex environment of today's automated Industry 4.0 environment. The focus of this program includes robot installation, programming, and troubleshooting. This program also includes Industrial Certifications that can be earned through the Smart Automation Certification Alliance (SACA).

Non-Credit Course Code	Course Title	Hours	Days
CCAD-8144	Advanced Technology Readiness	8	1
OSHA-8001	OSHA 10-Safety Training	16	2
CMNF-8312	Trade Fundamentals	48	6
CELC-8013	Electrical Fundamentals	40	5
CELC-8012	Motor Controls and Drives	40	5
CMNF-8241	FANUC Robotics Operations	40	5
CELC-8022	Electronic Sensors	24	3
CMNF-8283	HandlingPRO (ROBOGUIDE) Workcell Simulation	16	2
CMNF-8270	Advanced Robotics Operations	40	5
CMNF-8090	Robotics Electrical Troubleshooting and Maintenance	40	5
CMNF-8273	FANUC iRVision 2D	24	3
CMNF-8293	Machining Essentials	24	3
CMNF-8269	Fluid Power Fundamentals	40	5
CMNF-8242	Robotics Mechanical	40	5
CMNF-8247	Basic PLC	40	5
A certificate of completion will be awarded to students who successfully complete the above courses. Certifications earned for SACA will also be awarded.		480 hours	60 days

Non-Credit Course Descriptions

Advanced Technology Readiness - CCAD-8144- 8 hours

Prerequisite: None

The purpose of this course is to ensure the student is prepared to complete a short-term accelerated program in the engineering and advanced technology fields. This course will cover key aspects industry leaders state are necessary in the rapidly changing environment. Of the nine critical competencies sprinkled throughout the entire program in various courses via projects and tasks, this course will focus on communication and collaboration, digital media literacy, and entrepreneurism. Students will learn the fundamentals of a variety of software applications, learn how to be resourceful during the program, and discover how to operate with an entrepreneurial mindset.

OSHA 10 – OSHA 8001- 16 hours

Prerequisite: None

This sixteen (16) hour training course covers basic industrial safety. Topics include lockout/tagout, personal protective equipment, aerial lift and fall safety, machine guarding, confined space safety, fire safety, hazardous materials and hazard communications. General shop safety including forklift pedestrian safety will also be discussed. Upon successful completion participants receive an OSHA 10 certification.

Trade Fundamentals –CMNF-8312 – 48 hours
Prerequisite: None
This course includes a review of basic arithmetic; whole numbers, fractions, decimals, signed numbers, grouping symbols, square root, ratio and proportion, flat and round tapers, simple and complex gear ratios; practical industrial shop problems are employed. At the end of this course, student will be able to apply basic math and read a blueprint as it relates to machining components used in manufacturing.

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.

Electronic Sensors – CELC 8022 – 24 hours
Prerequisite: CELC 8013/Electrical Fundamentals
This twenty-four (24) hour course introduces the student to the newest and the most important electronic automation (Must Know Technology) of today, and the future. The student will be introduced to the many types and boundary ranges of sensors. Adjusting and alignment of sensors where needed will be included in the coursework. Sinking and sourcing explanations along with NPN and PNP types of sensors are included in the class. Interfacing sensors with PLC inputs and troubleshooting field wiring will also be covered.

HandlingPRO (ROBOGUIDE) Workcell Simulation – CMNF 8283 – 16 hours
Prerequisite: CMNF 8241/FANUC Robotics Operations
This sixteen (16) hour course is designed to provide the skills needed for creating a computer 3D simulated robotic workcell using FANUC ROBOGUIDE. Course topics include: Creating a Workcell; Add Parts to the Workcell; Edit Robot Properties; Add End-of-Arm Tooling to the Robot; Add a Pick and Place Fixture to the Workcell; Create/Run a Robot Program; Create an AVI of the Workcell

Advanced Robotics Operations – CMNF 8270 - 40 hours
Prerequisite: CMNF 8241/FANUC Robotics Operations
This forty (40) hour course is designed to provide the advanced skills needed to operate and program Fanuc robots. Course topics include collision guard, condition monitor function, executing multiple program (multi-tasking), program shift utility and systems operations.

Robotics Electrical Troubleshooting and Maintenance – CMNF 8090 – 40 hours
Prerequisite: CELC 8013/Electrical Fundamentals and CMNF 8241/FANUC Robotic Operations
This forty (40) hour course is designed to provide the basic skills needed to troubleshoot electrical repair and maintenance procedures of robotic electrical systems. Course topics include robot electrical component identification and function of robot electrical controller.

FANUC iRVision 2D – CMNF 8273 - 24 hours
Prerequisite: None
This twenty-four (24) hour course provides an understanding of how to program a vision system as a stand-alone solution and integrated into robotic systems. The student will understand general vision concepts, including camera setup, lighting, lensing, 2D Single & 2D Multiple View Process and perform hands-on programming with industrial vision systems.

Machining Essentials– CMNF 8293 - 24 hours
Perquisite: None
This twenty-four (24) hour course is designed to provide basic knowledge of manual machining equipment including grinders and sanders, drill press, lathes, and mills. Course topics include safety, speeds and feeds, drill press operation, Grinder operation and Saw operation.

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.

Robotics Mechanical – CMNF 8242 – 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.

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.

Smart Automation Certification Alliance (SACA)

Throughout the program, you will be able to take Certifications exams. Upon successful completion and passing of the SACA exams, the following Certifications can be awarded for students to earn during the Robot Technician program:
- ➢ Program Controller Systems 1
- ➢ Electrical Systems 1
- ➢ Sensor Logic Systems 1
- ➢ Robot Operations 1
- ➢ Hydraulic Systems 1
- ➢ Electric Motor Control Systems 1

- ✓ **Noncredit to Credit Articulation -Up to eight (8) credits may be available to you for certain degrees.**