

# Programmable Logic Controllers Certificate (PLCC)

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This hands-on training program is designed for the maintenance person who will install, program, maintain, and troubleshoot Programmable Logic Controllers (PLCs).

For more information call the Workforce Development Center at (513) 569-1643 or toll-free (888) 569-1709.

## Programmable Logic Controllers Certificate (PLCC)

Semester 1		Lec	Lab	Credits
TEM 140	Electrical Ladder Diagrams and Print Reading	1	0	1
TEM 180	Programmable Logic Controllers 1	2	1	2.5
Semester 2				
TEM 185	Programmable Logic Controllers 2	2	1	2.5
<b>Total Credits:</b>		<b>5</b>	<b>2</b>	<b>6</b>

## Courses

### TEM 105 Installation of Solar Thermal Systems 2.5 Credits. 2 Lecture Hours. 1 Lab Hour.

A course for individuals seeking to become installers of solar thermal systems. Topics include: fundamental concepts of solar thermal systems; and design, installation, troubleshooting, and commissioning of systems.

Prerequisites: None

### TEM 107 Install Photovoltaic Sys 3 Credits. 3 Lecture Hours. 0 Lab Hour.

A course on fundamental concepts and techniques for installing solar photovoltaic (PV) systems. Topics include: designing PV systems and safely installing solar-electric systems. This course prepares students for the NABCEP PV Entry Level Certificate of Knowledge exam.

Prerequisites: None

### TEM 110 Electrical Systems 1 Credit. 1 Lecture Hour. 0 Lab Hour.

An course on electrical systems found in a manufacturing facility. Topics include: motors and motor control, meters and testing devices, power distribution, and electrical systems.

Prerequisites: None

### TEM 115 Electrical Safety 1 Credit. 1 Lecture Hour. 0 Lab Hour.

A course on electrical safety issues based on NFPA 70E. Topics include: electrical hazards, comparison of qualified and non-qualified workers, lockout/tagout, safe electrical work practices, and PPE.

Prerequisites: None

### TEM 120 Industrial Electricity for AC and DC Circuits 2.5 Credits. 2 Lecture Hours. 1 Lab Hour.

A course on fundamental concepts and safe maintenance techniques used when working with electrical devices and applications.

Prerequisites: None

### TEM 125 Industrial Electronic Devices 2.5 Credits. 2 Lecture Hours. 1 Lab Hour.

A course on theory, operation, application, and troubleshooting of solid-state devices used in industrial equipment and controls. Topics include: semi-conductors; transistors as switches; and amplifiers, SCRs, LEDs, and integrated circuits.

Prerequisites: None

### TEM 130 Electrical Control System Devices 1 Credit. 1 Lecture Hour. 0 Lab Hour.

A course on the devices typically found in an industrial control panel, including relays, timers, contactors, terminal blocks, and control transformers.

Prerequisites: None

### TEM 140 Electrical Ladder Diagrams and Print Reading 1 Credit. 1 Lecture Hour. 0 Lab Hour.

A course on concepts and skills needed to interpret electrical prints and construct electrical ladder diagrams.

Prerequisites: None

### TEM 150 Industrial Power Systems 1 Credit. 1 Lecture Hour. 0 Lab Hour.

A course on concepts and skills for working with modern power distribution systems. Topics include: transformers, circuit protection, 1-line diagrams, grounding, switch gears, and electrical safety.

Prerequisites: None

### TEM 160 Motors, Motor Controls, and Drives 2.5 Credits. 2 Lecture Hours. 1 Lab Hour.

A course for maintenance personnel involved in selection, installation, and troubleshooting of industrial 480 three-phase motors, controls and frequency drives. Topics include: control circuits, overload protection, and auxiliary control devices.

Prerequisites: None

### TEM 165 Motion Control Devices and Systems 1.5 Credit. 1 Lecture Hour. 1 Lab Hour.

A course for the industrial electrician or electrical maintenance technician responsible for installing or troubleshooting motion control devices. Topics include: types and applications of motion control devices used in industry.

Prerequisites: None

### TEM 170 Sensors for Industrial Control Systems 1 Credit. 1 Lecture Hour. 0 Lab Hour.

A course for maintenance personnel covering selection, installation, and troubleshooting of discrete and analog sensors commonly found in manufacturing operations. Topics include: limit switches, pressure switches, proximity switches, photo eye sensors, process sensors with analog outputs, and motion sensors.

Prerequisites: None

**TEM 175 Variable Frequency Drives**

**2.5 Credits. 2 Lecture Hours. 1 Lab Hour.**

A course on application, selection, installation, programming, and troubleshooting of Variable Frequency Drives (VFDs) used in industry. Topics include: test equipment and motor controls; hardware identification; and determining parameter values for load, torque, and speed.

Prerequisites: None

**TEM 180 Programmable Logic Controllers 1**

**2.5 Credits. 2 Lecture Hours. 1 Lab Hour.**

A course on operation, installation, basic programming, and troubleshooting of programmable logic controllers (PLCs) using Allen Bradley SLC-500 and CompactLogix PLCs.

Prerequisites: None

**TEM 185 Programmable Logic Controllers 2**

**2.5 Credits. 2 Lecture Hours. 1 Lab Hour.**

A continuation of TEM 180, emphasizing techniques used by electricians or instrument technicians who install and troubleshoot advanced PLCs. Topics include: advanced and special program instruction, Human-Machine Interface (HMIs), and communication networks.

Prerequisites: TEM 180

**TEM 190 Troubleshooting Industrial Electrical Equipment**

**2.5 Credits. 2 Lecture Hours. 1 Lab Hour.**

A course on systematic approaches for troubleshooting electrical equipment used in industry.

Prerequisites: None