C-207 Programmable Controller Systems 1
Course Credential

About this course

This SACA certified C-207 Programmable Controller Systems 1 course prepares students for a career in an industrial automated 4.0 industry environment. Participants are taught to program, configuration, adjust, monitor, and operate industrial programmable logic controller (PLC) systems.

Modules to be covered

1. **Standard 207.1 Start up and shut down a PLC system**
   - Performance Indicators:
     - Power up and perform a normal shutdown of a PLC system
     - Identify the parts of a PLC
   - Knowledge Indicators:
     - Describe the basic operation of a programmable controller (PLC)
     - Describe the component functions of a PLC
     - Describe the operation of the PLC power supply circuit

2. **Standard 207.2 Configure an Ethernet/IP Driver**
   - Performance Indicators:
     - Configure an Ethernet/IP Driver to permit PLC to PC communications
   - Knowledge Indicators:
     - Describe the function of Ethernet/IP driver software

3. **Standard 207.3 Transfer programs between a PLC / PC via point-to-point Ethernet**

- Performance Indicators:
  - Connect and configure a point-to-point PLC Ethernet network
  - Download a PLC project from a PC via point-to-point Ethernet
  - Upload a PLC project to a PC via point-to-point Ethernet
- Knowledge Indicators:
  - Describe the basic operation of a point-to-point Ethernet network
  - Describe the Ethernet IP address system for point-to-point
  - Describe the basic operation of PLC programming software

4. **Standard 207.4 Transfer programs between a PLC / PC via USB serial**

- Performance Indicators:
  - Connect and configure a point-to-point PLC serial network
  - Download a PLC project from a PC via point-to-point USB serial
  - Upload a PLC project to a PC via point-to-point USB serial
- Knowledge Indicators:
  - Describe the basic operation of USB serial communications
  - Describe the USB configuration using PLC programming software

5. **Standard 207.5 Operate and monitor a PLC**

- Performance Indicators:
  - Change PLC operation mode to Run or Program
  - Monitor PLC status using I/O indicators and software
- Knowledge Indicators:
  - Describe the functions of PLC operation modes

6. **Standard 207.6 Connect, configure, and operate an HMI panel with Ethernet**

- Performance Indicators:
  - Connect and configure HMI panel with Ethernet network
  - Download a project to an HMI panel via an Ethernet network

o Operate a basic HMI panel project with Ethernet network

- Knowledge Indicators:

  o Describe the operation of a Human Machine Interface (HMI) panel

  o Describe basic functions of an HMI panel project

7. **Standard 207.7 Configure PLC discrete I/O**

- Performance Indicators:

  o Configure PLC discrete I/O

  o Identify a discrete I/O terminal given a tag

- Knowledge Indicators:

  o Describe the memory organization of a typical PLC

  o Describe types of discrete PLC I/O modules

  o Describe how discrete I/O devices are interfaced to a PLC

  o Describe the format of PLC instruction and I/O addresses

  o Interpret a tag

8. **Standard 207.8 Program and operate a basic PLC logic program**

- Performance Indicators:

  o Interpret a basic PLC ladder logic program

  o Interpret a basic PLC I/O diagram

  o Interpret a basic PLC power diagram

  o Design and test a basic PLC ladder program

- Knowledge Indicators:

  o Describe operation of a basic PLC logic instructions: normally-open, normally-closed, output coil, internal coils, timers, and up/down counters

  o Describe the symbolic, absolute discrete I/O address system

9. **Standard 207.9 Create a PLC project**

- Performance Indicators:

  o Create a PLC project

  o Enter and operate a PLC logic program

- o Edit a PLC project
- Knowledge Indicators:
  - o Describe the elements of a PLC project

10. **Standard 207.10 Program and operate a PLC logic program that uses comparison instructions**
    - Performance Indicators:
      - o Interpret a PLC logic program that uses comparison instructions
      - o Enter and operate a PLC logic program that uses comparison instructions
      - o Interpret the operation a PLC logic program that uses comparison instructions
    - Knowledge Indicators:
      - o Describe the operation of PLC comparison instructions

11. **Standard 207.11 Program and operate a PLC project that uses math instructions**
    - Performance Indicators:
      - o Interpret a PLC logic program that uses basic math instructions: Add, Subtract, Divide, and Multiply
      - o Enter and operate a PLC program that uses basic math instructions
      - o Interpret a PLC logic program that uses a Compute instruction
      - o Enter and operate a PLC program that uses a Compute instruction
      - o Design and test a PLC program that uses math instructions
    - Knowledge Indicators:
      - o Describe operation and applications of basic PLC math instructions
      - o Describe operation and applications of PLC Compute instruction

12. **Standard 207.12 Program and operate a PLC motor control sequence program**

- Performance Indicators:
  - o Interpret the operation of PLC motor control sequence program
  - o Design and test operation of a PLC motor control sequence program
- Knowledge Indicators:
  - o Describe the operation of a seal-in logic program
  - o Describe the operation of a PLC-controlled motor control circuit
  - o Describe the operation of a reversing motor control

13. **Standard 207.13 Program and operate a basic PLC sequence program**

- Performance Indicators:
  - o Interpret the operation of an event-driven 2-step PLC sequence program
  - o Interpret the operation of a time-driven 2-step PLC sequence program
  - o Design and test a basic event-driven PLC sequence program
  - o Design and test a time-driven PLC sequence program
- Knowledge Indicators:
  - o Describe the operation of an event-driven PLC sequence program
  - o Describe the operation of a time-driven PLC sequence program