



# PROFESSIONAL DEVELOPMENT

University Extended Education  
California State University, Fullerton

## Certificate in INDUSTRIAL CONTROLS

### Endorsed by the International Society of Automation (ISA), Orange County Section

Get the skills you need for a successful career in industrial controls technology. The industrial controls technology job market continues to be among the fastest growing for technical professionals. That's because today's manufacturing and business environments require continued investment in automation technology to ensure lower costs, higher quality and greater productivity. As a result, the salary for industrial controls professionals remains high compared to other career paths.

This technology is also one of the fastest changing, and today's industrial control system vendors are quick to implement the latest technologies in sensor design and network capabilities. For that reason, this certificate program is revised continuously to assure that the curriculum includes the most current technology and methods.

This program is an opportunity for professional and technical personnel to increase their competence, and position themselves to contribute to project teams tasked with implementing and modernizing automation/control systems. The Certificate in Industrial Controls Technology is endorsed by the International Society of Automation (ISA), Orange County Section.

You will learn from instructors who are highly-qualified practitioners in the field. They are all located here in Southern California, have outstanding credentials and are members of, or have recommendations from ISA.

### Graduates of this program will know:

- Principles of tuning automatic control systems
- Instrumentation
- Data acquisition systems, HMI and SCADA
- Programmable logic (PLC) and computer-based controllers
- Practical applications of process and environmental controls
- Discrete manufacturing and material handling systems
- Plant networks



### Who Should Attend?

- Public Utility Managers/Technicians
- Building Supervisors
- Manufacturing Floor Supervisors
- Quality Assurance Managers
- Facilities Managers/Operators
- Plant/Factory Managers
- Those who are interested in beginning or advancing a career in industrial technology

Register today at [extension.fullerton.edu/professionaldevelopment](http://extension.fullerton.edu/professionaldevelopment) or 657.278.2611  
For more information, contact Makeda Seyoum: 657.278.8392, [mseyoum@fullerton.edu](mailto:mseyoum@fullerton.edu)  
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# Certificate in INDUSTRIAL CONTROLS

## THE CLASSES

The Certificate in Industrial Controls Technology consists of 132 hours of lecture and hands-on computer lab instruction. 13.2 Continuing Education Units (CEUs) will be awarded to the certificate graduates.

### Continuous Control Systems

(2.4 CEUs/24 hours)

Learn the practical fundamentals of automatic process control theory through classroom case analysis and hands-on problem solving. You will learn the four basic characteristics of every industrial process, and use this understanding to control and tune the process loop. Explore the cause and effect relationship of properties of physical systems and their control, feedback control stability and response characteristics, basics of traditional three mode (proportional integral and derivative) tuning of control loops. Advanced control topics include ratio, cascade, modeling of physical systems, feed forward, override, and multi-variate control. You will get hands-on practice using PC Control Lab software. Many of our students report immediate returns from this class because they are able to apply what they are learning to solving their in-plant control problems.

### PLC and Soft Logic Controllers

(1.8 CEUs/18 hours)

Programmable logic controllers continue to be used as the primary control device in the industrial control industry. In addition Soft Logic Controllers have begun to emerge as an alternative method of control in many applications. In this hands-on class, students will learn PLC and control fundamentals including ladder logic, statement list and function block programming. Students will gain experience in control systems design, programming and PLC/Soft Logic based process control through lab exercises. Evaluation and selection of system components as well as advanced programming examples will be discussed.

### Networks for Industrial Applications

(2.4 CEUs/24 hours)

The industrial control industry has moved from a control-centric focus to an information-centric focus. Industrial Ethernet and I/O Bus networks have become more commonplace over legacy proprietary networks. Today's industrial networks are designed to provide a connection between industrial devices to capture critical plant floor data in addition to providing control. This hands-on class will provide the student with an understanding of network systems, Industrial Ethernet, OPC connectivity, Wireless communications, network security, and supervisory control/data acquisition software. Students will utilize lab assignments as well as Web-based research to enhance their learning experience.

### Advanced PLC Programming

(1.8 CEUs/18 hours)

*Prerequisite: PLC and Soft Logic Controllers.* This is an advanced programming class where students learn how to plan, program, and implement a control application. The class includes ladder logic, statement list, and function block programming languages. Learn the benefits of using different languages including those specified in the IEC 1131-3 standard. The proper way to organize projects through effective project management techniques will also be covered, including timing charts, flow charts, and process instrumentation diagrams. Programming strategies for discrete, continuous, and batch applications will be discussed. Gain programming experience through hands-on lab exercises.

### Instrumentation and Data Acquisition Systems

(2.4 CEUs/24 hours)

The heart of the plant is the process information collected. Sensors collect and monitor the plant and transmitting devices allow the control or direction of the plant. Signals present in the plant can generally be grouped into either continuous (analog) or event (digital) signals. This class reviews sensors and measuring systems used to monitor process information such as temperature, pressure, level and flow, proximity, and other sensors will be discussed. Computer based data acquisition will be covered including analog signal conditioning and filtering, system grounding and ground loops, single ended vs. differential signals, common noise rejection, instrumentation and programmable gain amplifiers, multiplexing signals, analog to digital conversion, signal quantization, aliasing errors, Nyquist criteria, digital filtering, alarm processing and data analysis. Students will build and run data acquisition systems with simulated process signals.

### Process and Environmental Control Systems

(2.4 CEUs/24 hours)

Green is today's buzz word. Green products and practices save the environment while also saving money. Learn how major companies are cashing in by implementing "green" control technologies. Learn specific industrial control technologies that are being used to "green" food processing, chemical, materials processing, water and wastewater, aerospace, building management, energy management, pollution control, and more. Classroom exercises help you practice how to identify and quantify green opportunities, how to implement them, and how to sell them to your management, customers, and investors.

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