# Specialized Certificate in Industrial Controls

(1.5 Year)

Industrial Controls is offered as a Specialized Certificate for electrical apprentices who have completed at least two years of their apprenticeship, licensed electricians, and individuals who hold prior degrees with a foundation in electrical systems or electronics.

## Program Educational Objectives

1. Solve technical problems typical of those encountered in the industrial automation discipline by using critical thinking skills, current technology, and practical use of trade equipment.
2. Work and communicate effectively in multidisciplinary teams in an industrial setting.
3. Demonstrate a commitment to lifelong learning and staying current with technical standards and codes.

## Student Learning Outcomes

1. Demonstrate safe work practices.
2. Work and communicate effectively in a diverse team environment.
3. Utilize test equipment to troubleshoot discipline related circuits.
4. Analyze single phase alternating current (AC), three phase AC , and direct current (DC) electrical circuits.
5. Create and interpret discipline-specific technical documentation.
6. Construct and troubleshoot circuits for motor controls and associated devices.
7. Design and troubleshoot control systems consisting of Programmable Logic controllers (PLC) / Programmable Automation Controllers (PAC) and associated Human Machine Interfaces (HMI).
8. Install and troubleshoot electrical AC and DC motors and variable frequency drives for operation within an architecture.
9. Utilize the fundamentals of networks and digital communications to troubleshoot distributed plant automation and Supervisory Control and Data Acquisition (SCADA) systems.
10. Configure and troubleshoot process instrumentation systems.
11. Troubleshoot and optimize process control loops.
12. Use the fundamentals of pump and valve operation to troubleshoot final element issues.
13. Demonstrate knowledge of motor monitoring equipment and switchgear.

## Admissions Requirements

Admission to the Industrial Controls Specialized Certificate requires applicants to meet one of the following criteria: completion of at least two years in an electrical apprenticeship program, current state electrician licensure, or possession of a prior degree with a foundation in electrical systems or electronics. All applicants must also demonstrate the necessary math proficiency by earning an ALEKS placement score of 30 or higher.

Official test scores must be dated within one year of program admission.

| Placement Test | Math |
|---|---|
| ALEKS | 30 |

## Major Requirements

| Code | Title | Credits |
|---|---|---|
| **Required Courses:** | | |
| ESET 1140 | Applied Technical Intermediate Algebra | 5 |
| IAET 2000 | Fundamentals of Measurement and Control | 2 |
| IAET 2000L | Fundamentals of Measurement and Control Laboratory | 1 |
| IAET 2050 | Introduction to Automation | 3 |
| IAET 2050L | Introduction to Automation Laboratory | 4 |
| ESET 1181 | Introduction to Cyber-Physical Systems | 3 |
| IAET 2100 | Motor Control Theory | 4 |
| IAET 2100L | Motor Control Laboratory | 2 |
| IAET 3000 | PLC Programming Theory | 2 |
| IAET 3000L | PLC Programming Laboratory | 4 |
| IAET 3100 | Process Measurement Theory | 3 |
| IAET 3100L | Process Measurement Laboratory | 2 |
| IAET 3150 | Process Control Theory | 4 |
| IAET 3150L | Process Control Laboratory | 3 |
| IAET 3200 | Industrial Networking | 2 |
| Students are required to earn a grade of C- or better in each ESET and IAET courses. | | |
| **Total Credits** | | **44** |