

A.A.S. Industrial Controls

(1 Year)

Description:

Industrial Controls is offered as a second AAS degree following completion of an Electrical Journeyman AAS, or an Electrical Apprenticeship AAS program and completion of all General Education requirements. Students must have completed a minimum of three years of the Electrical Apprenticeship Program towards the first AAS degree before being able to apply for the Industrial Controls program. Students in this program can complete coursework focusing on either Instrumentation and Process Control or Motor Control and Protective Relaying.

Program Objectives:

1. Solve technical problems typical of those encountered in the energy systems instrumentation engineering technology discipline by using critical thinking skills, current technology, and principles of mathematics and applied science.
2. Work and communicate effectively in multidisciplinary teams in both industrial and academic settings.
3. Understand current professional issues and the need to pursue lifelong learning.

Student Outcomes:

1. Demonstrate safe work practices on industrial equipment.
2. Work and communicate effectively in a diverse team environment.
3. Utilize test equipment to troubleshoot and analyze electrical, electronic, and instrumentation related circuits.
4. Analyze alternating current (AC) and direct current (DC) electronic circuits and logic fundamentals.
5. Create schematics to document electrical, electronic, and process control systems.
6. Design and troubleshoot circuits for motor controls and associated devices.
7. Install, troubleshoot, and maintain electrical AC and DC motors, generators, and variable frequency drives.
8. Install, configure, calibrate, and troubleshoot pressure, temperature, level, flow, and analytical instrumentation.
9. Configure, troubleshoot, and optimize Proportional-integral-Derivative (PID) control loops.
10. Use the fundamentals of pump and valve operation to troubleshoot final element issues.
11. Utilize the fundamentals of fluid dynamics and thermodynamics to troubleshoot and maintain process control associated with industrial plants.
12. Design, implement, and troubleshoot Programmable Logic Controllers (PLC) programs and associated Human Machine Interface (HMI) applications for industrial processes.
13. Utilize the fundamentals of networks and digital communications to troubleshoot and maintain distributed plant automation and Supervisory Control and Data Acquisition (SCADA) systems.

Program Admissions Requirements

Entry into Industrial Controls Associate degree programs requires completion of: the first two years of the Electrical Apprenticeship AAS degree program; ESET 1100, ESET 1100L, ESET 1101, ESET 1101L, ESET 1102, ESET 1102L, ESET 1140; or instructor approval. Program degrees will be awarded concurrently with completion of the Electrical Apprenticeship degree requirements.

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

Placement Test	Math
ALEKS	30

General Education

The listing below includes program requirements that also fulfill General Education requirements.

Code	Title	Credits
Objective 1 - ENGL 1101 ¹		3
Objective 2 - COMM 1101		3
Objective 3 - MATH 1143 ¹		3
Objective 5 -CHEM 1100 or PHYS 1101 and PHYS 1101L		4
Objective 6		3
Total Credits		16

¹ "P" courses are equivalent to the original course.

Prerequisite Courses

Students must complete nine (9) credits of the University's General Education Objectives (see the General Education Requirements described in the Academic Information section of this catalog) and a minimum of five to six (5-6) credits of program-specific course work before entering this program. Listed below are the prerequisite requirements for the Associate of Applied Science: Industrial Controls. Students must meet with the program coordinator prior to beginning required course work.

Code	Title	Credits
Prerequisite Courses (14-15 Credits)		
ESET 1110 & 1110L	Introduction to Process Control and Introduction to Process Control Laboratory	2-3
or ESET 1111	Principles of AC Circuit Analysis	
ESET 1112	Introduction to Digital Logic	2
ESET 1112L	Introduction to Digital Logic Laboratory	1
COMM 1101	Fundamentals of Oral Communication	3
ENGL 1101	Writing and Rhetoric I	3
MATH 1143	Precalculus I: Algebra	3
Required Courses (33-34 Credits)		

INST 2281 & INST 2282 & INST 2293 & INST 2295 & INST 2296	Electrical Automation Theory and Electrical Automation Laboratory and Process Measurement and Control Laboratory and Process Measurement and Control Theory and Process Dynamics	27
OR		
ESET 2222 & ESET 2226 & ESET 2292 & ESET 2292L & ESET 2293 & ESET 2293L	Process Control Theory and Process Control Devices Laboratory and Electrical Engineering Technology I and Electrical Engineering Technology I Laboratory and Electrical Engineering Technology II and Electrical Engineering Technology II Laboratory	26
CHEM 1100 or PHYS 1101/1101L	Concepts of Chemistry Elements of Physics	4
Objective 6: Social and Behavioral Ways of Knowing		3
Total Credits		47-49

Degree Totals

Code	Title	Credits
Program Admission Requirements (Required General Education credits removed)		5-6
General Education		16
Major Requirements (Required General Education credits removed)		37
Free Electives		
Total Credits		58-59