

# INTEGRATED SYSTEMS ENGINEERING TECHNOLOGY, ASSOCIATE OF APPLIED SCIENCE



The Integrated Systems Engineering Technology program prepares students to diagnose and resolve industrial equipment problems using good technical assessment skills and core electrical skills. The program also provides students with a base knowledge in advanced skills such as Programmable Logic Controllers (PLCs) electronics and digital applications, robotics, and process controls. Students completing the Integrated Systems Engineering Technology program will find jobs as instrument control technicians, maintenance repair technicians, electrical maintenance technicians, power plant control room operators, or integrated systems technicians.

**Program contact:** Learn more (<http://www.tri-c.edu/programs/engineering-technology/integrated-systems-engineering-technology>)

**This degree program contains one or more embedded certificates which will be automatically awarded when the certificate requirements are completed. If you do not want to receive the embedded certificate(s), please notify the Office of the Registrar at [RegistrarOffice@tri-c.edu](mailto:RegistrarOffice@tri-c.edu).**

Learn more here (<http://catalog.tri-c.edu/pathways/industrial-manufacturing-construction/integrated-systems-engineering-technology>) and here (<http://catalog.tri-c.edu/pathways/science-technology-engineering-mathematics/integrated-systems-engineering-technology>) about how certificate credits apply to the related degree.

## Related Degrees and Certificates

- Automation Maintenance Technician, Certificate of Proficiency (<http://catalog.tri-c.edu/programs/automation-maintenance-technician-certificate-proficiency>)
- Building Maintenance Technician, Certificate of Proficiency (<http://catalog.tri-c.edu/programs/building-maintenance-certificate-proficiency>)
- Mechatronics, Certificate of Proficiency (<http://catalog.tri-c.edu/programs/mechatronics-certificate-proficiency>)
- Industrial Welding, Certificate of Proficiency (<http://catalog.tri-c.edu/programs/industrial-welding-certificate-proficiency>)
- Introductory Welding, Short-Term Certificate (<http://catalog.tri-c.edu/programs/introductory-welding-short-term-certificate>)
- Welding Technology, Short-Term Certificate (<http://catalog.tri-c.edu/programs/welding-technology-short-term-certificate>)

## Related Training and Credentials

- Fast-Track Welding Certificate Program (<http://catalog.tri-c.edu/programs/fast-track-welding-certificate>)
- Electrical Technician Certificate of Completion (<http://catalog.tri-c.edu/programs/electrical-technician-certificate>)
- Facility Technician (<http://catalog.tri-c.edu/programs/facility-technician>)
- FirstEnergy Power Systems Institute PSI, Associate of Technical Study (<http://catalog.tri-c.edu/programs/firstenergy-power-systems-institute-psi-ats>)
- Steelworkers for the Future (<http://catalog.tri-c.edu/programs/steelworkers-future>)
- Industrial Automation Certificate of Completion (<http://catalog.tri-c.edu/programs/industrial-automation-certificate>)
- Nondestructive Testing (NDT) and Quality Assurance (QA) (<http://catalog.tri-c.edu/programs/nondestructive-testing-ndt-quality-assurance-qa>)

## Program Admission Requirements

- High School Diploma/GED
- ENG-0990 Language Fundamentals II or appropriate score on English Placement Test.
- MATH-0910 Basic Arithmetic and Pre-Algebra or appropriate score on Math Placement Test.

## Other Information

- Options available in Integrated Systems Maintenance - Fluid Power and Programmable Logic Controllers, Environmental Systems Maintenance - Boiler, HVAC, and Welding.

## Program Learning Outcomes

This program is designed to prepare students to demonstrate the following learning outcomes:

1. Identify, select, and operate appropriate test equipment and tools, and interpret test results to solve problems in a controlled environment.
2. Use team skills to collaborate and perform in a professional and workman like fashion in a diverse workforce and a dynamic environment to meet organizational goals and objectives.
3. Apply appropriate Math, Science, and computer skills to support installation, troubleshooting, and maintenance of electrical equipment and systems.
4. Demonstrate effective comprehension and communication skills through listening, writing and speaking about problems, processes, and procedures to supervisors, team members, and management.
5. Diagnose and resolve equipment problems by utilizing good technical assessment skills that include planning, reliability, logical thinking, ability to use drawings, schematics and documentation, and a solid understanding of electrical maintenance theory and principles.
6. Work with a safety-focuses mindset and follow industry safety standards, local regulations, and company policies and procedures.
7. Apply the fundamentals of electrical/electronic skills including wiring methods, motor controls, National Electric Code, troubleshooting and print reading and exhibit base knowledge in advanced skills such as PLC's, electronics and digital applications, robotics, and process controls.

8. Employ cross-functional skills to differentiate between thermal, mechanical, fluid and electrical power systems, and isolate and resolve breakdown(s).

Letters in parenthesis relate to Options (a) Integrated Systems Maintenance and (b) Environmental Systems Maintenance and (c) Welding

## Suggested Semester Sequence

Course	Title	Credit Hours
<b>First Semester</b>		
ISET-1300	Mechanical/Electrical Print Reading	2
ISET-1310	Mechanical Power Transmission	2
ISET-1410	Applied Electricity I	3
MATH-1240	Contemporary Mathematics	3
Option B:		
ISET-1450	Heating Ventilation Air Conditioning/ Refrigeration I (Option B)	
Option C:		
ISET-1101	Welding Blue Print Reading (Option C)	
Select one of the following: 3		
ENG-1010	College Composition I	
ENG-101H	Honors College Composition I	
Credit Hours		13
<b>Second Semester</b>		
ISET-1340	Industrial Piping and Tubing	2
ISET-1420	Applied Electricity II	3
Option A:		
ISET-1320	Fundamentals of Fluid Power (Option A)	
Option B:		
ISET-1460	Fundamental Boiler Technology (Option B)	
Option C - Select one of the following:		
ISET-2100	Gas Metal Arc Welding (MIG) (Option C)	
ISET-2120	Shielded Metal Arc Welding (STICK) (Option C)	
Select one of the following: 3		
IT-1090	Computer Applications	
IT-109H	Honors Computer Applications	
Credit Hours		8
<b>Summer Session</b>		
ISET-2200	Industrial Motor Controls	3
COMM-1000	Fundamentals of Interpersonal Communication	3
Credit Hours		6
<b>Third Semester</b>		
ENG-2151	Technical Writing	3
ISET-2240	Applied National Electric Code	3
ISET-2500	Programmable Logic Controllers Maintenance I	3
PSY-1050	Introduction to Industrial/Organizational Psychology	3
Option A:		
MET-2300	Fluid Power (Option A)	

Option B:

ISET-2450	Heating Ventilation Air Conditioning/ Refrigeration II (Option B)	
Option C - Select one of the following:		
ISET-2110	Gas Tungsten Arc Welding (TIG) (Option C)	
ISET-2131	Oxyfuel Processes/Plasma Processes (Option C)	
Credit Hours		12

**Fourth Semester**

BADM-1050	Professional Success Strategy	3
ISET-2210	Commercial Wiring	3
ISET-2220	Fundamentals of Electronics and Instrumentation	3
ISET-2990	Reliability Centered Maintenance	3
Option A - Select one of the following:		
ISET-2510	Programmable Logic Controllers Maintenance II (Option A) <sup>1</sup>	
ISET-2520	Programmable Logic Controllers Maintenance III (Option A) <sup>1</sup>	
Option B:		
ISET-2460	Applied Boiler Technology (Option B)	
Credit Hours		12
Total Credit Hours		51

<sup>1</sup> Consecutive eight week course.

## Options

### (A) Integrated Systems 8

#### Fluid Power and Programmable Logic Controllers Option (A)

Code	Title	Credit Hours
ISET-1320	Fundamentals of Fluid Power	2
MET-2300	Fluid Power	3
ISET-2510	Programmable Logic Controllers Maintenance II	2
ISET-2520	Programmable Logic Controllers Maintenance III	2
Additional program courses		51
Total Credit Hours		60

### (B) Environmental Systems

#### Boiler Technology, HVAC, Option (B)

Code	Title	Credit Hours
ISET-1450	Heating Ventilation Air Conditioning/ Refrigeration I	2
ISET-1460	Fundamental Boiler Technology	3
ISET-2450	Heating Ventilation Air Conditioning/ Refrigeration II	2
ISET-2460	Applied Boiler Technology	2
Additional program courses		51
Total Credit Hours		60

**(C) Integrated Systems**

**Welding, Option (C)**

To complete this option, students must complete ISET-1101 Welding Blue Print Reading and two of the four welding courses listed below.

<b>Code</b>	<b>Title</b>	<b>Credit Hours</b>
ISET-1101	Welding Blue Print Reading	3
Select two of the following:		8
ISET-2100	Gas Metal Arc Welding (MIG)	
ISET-2120	Shielded Metal Arc Welding (STICK)	
ISET-2110	Gas Tungsten Arc Welding (TIG)	
ISET-2131	Oxyfuel Processes/Plasma Processes	
Additional program courses		51
Total Credit Hours		62