Central Carolina Community College
An Equal Opportunity College

Industrial Systems Technology
Credential: Certificate in Electrical Controls
C5024010

This curriculum will provide students with knowledge of electricity and electrical controls. Students will learn AC/DC electricity, pilot devices, control relays, motor starters, and electromechanical devices. Upon completion, students will have the flexibility of pursuing a Diploma or an Associate in Applied Science Degree in Industrial Systems Maintenance Technology.

Program Length: 2 semesters
Career Pathway Options: Associate in Applied Science in Industrial Systems Technology (Higher entrance standards required); Diploma in Industrial Systems Technology (Higher entrance standards required); Certificate in Electrical Controls
Program Sites: Lee Campus - Evening Program

Course Requirements for Electrical Controls Certificate

A. Required Subject Areas (5 SHC)		C-L-SHC
ELC 112	DC/AC Electricity	3-6-5
B. Other Major Hours Required for Graduation (11/12 SHC)		
ELC 117	Motors and Controls	2-6-4
ELC 128	Introduction to PLC	2-3-3
ELN 231	Industrial Controls	2-3-3
ISC 110	Workplace Safety	1-0-1
	OR	
ISC 112	Industrial Safety	2-0-2

Total Semester Hours Credit required for graduation: 16/17

Semester Curriculum for Electrical Controls Certificate

1st Semester (Fall)		C-L-SHC
ELC 112	DC/AC Electricity	3-6-5
ELC 128	Introduction to PLC	2-3-3
		5-9-8
2nd Semester (Spring)		
ELC 117	Motors and Controls	2-6-4
ELN 231	Industrial Controls	2-3-3
ISC 110	Workplace Safety	1-0-1
	OR	
ISC 112	Industrial Safety	2-0-2
		5/6-9-8/9

Total Semester Hours Credit: 16/17

COURSE DESCRIPTIONS

ELC 112 DC/AC Electricity 3-6-5
This course introduces the fundamental concepts of and computations related to DC/AC electricity. Emphasis is placed on DC/AC circuits, components, operation of test equipment; and other related topics. Upon completion, students should be able to construct, verify, and analyze simple DC/AC circuits.

ELC 117 Motors and Controls 2-6-4
Prerequisites: ELC 111, ELC 112 or ELC 131
This course introduces the fundamental concepts of motors and motor controls. Topics include ladder diagrams, pilot devices, contactors, motor starters, motors, and other control devices. Upon completion, students should be able to properly select, connect, and troubleshoot motors and control circuits.

ELC 128 Introduction to PLC 2-3-3
This course introduces the programmable logic controller (PLC) and its associated applications. Topics include ladder logic diagrams, input/output modules, power supplies, surge protection, selection/installation of controllers, and interfacing of controllers with equipment. Upon completion, students should be able to install PLCs and create simple programs.

ELN 231 Industrial Controls 2-3-3
Prerequisites: ELC 112, ELC 131, or ELC 140
This course introduces the fundamental concepts of solid-state control of rotating machinery and associated peripheral devices. Topics include rotating machine theory, ladder logic, electromechanical and solid state relays, motor controls, pilot devices, three-phase power systems, and other related topics. Upon completion, students should be able to interpret ladder diagrams and demonstrate an understanding of electromechanical and electronic control of rotating machinery.

ISC 110 Workplace Safety 1-0-1
This course introduces the basic concepts of workplace safety. Topics include fire, ladders, lifting, lock-out/tag-out, personal protective devices, and other workplace safety issues related to OSHA compliance. Upon completion, students should be able to demonstrate an understanding of the components of a safe workplace.

ISC 112 Industrial Safety 2-0-2
This course introduces the principles of industrial safety. Emphasis is placed on industrial safety, OSHA, and environmental regulations. Upon completion, students should be able to demonstrate knowledge of a safe working environment and OSHA compliance.