

Course Code: ELT 155

Course Title: Digital Control Systems

Department: Applied Sciences and Technologies

Effective Date: Summer 2026

PCS Code: 1.2 - Occupational/Technical Instruction

CIP Code: 15.1201

Repeatability: 0

Credit Hours

Catalog Notation: 2-2-3

Credit Hour Distribution:

Lecture: 2

Lab: 2

Clinical: 0

Total: 3

General Course Information

Catalog Description

Digital control using a microcontroller; software control of counters, sequencing, logical decisions, digital outputs, digital inputs, analog input to digital conversion, digital to analog output conversion.

General Course Objectives

Operate and program a microcontroller to control counters, sequencing, logical decisions, digital outputs, digital inputs, analog input to digital conversion, and digital to analog output conversion.

Minimum Placement Levels

English

None

Reading

None

Math

None

Prerequisites

Credit or concurrent enrollment in ELT 150

Methods of Evaluation

Students will be given a minimum of 6 quizzes, 1 mid-term exam, 1 final exam, 10 labs, and 5 in-class or homework assignments.

Instructional Materials and Additional Supplies

Textbook: [Electronics for Electricians](#), 7th ed. Herman, Steven. ISBN# 978-1305505995

Safety Glasses

Course Content

General Learning Outcomes (GLOs)

- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Numbering Systems	<ol style="list-style-type: none"> Read, count, and convert Base 2, 16, and 10. Debug microcontroller programming to count in Base 2, 16, and 10. 	4	4	0
Logic Gate Functions and Boolean Algebra	<ol style="list-style-type: none"> Define the 5 basic logic gate functions and the X-OR, X-NOR logic gates by symbol, equation, and truth table. Debug microcontroller programming to make logical software decisions. 	4	4	0
Control Digital Electrical Output Signals	<ol style="list-style-type: none"> Evaluate logic in truth table or diagram. Debug microcontroller programming to control near-simultaneous changes in multiple digital electrical output signals. 	8	8	0
Computer Arithmetic	<ol style="list-style-type: none"> Write numbers in signed magnitude and perform addition and subtraction. Debug microcontroller programming to add, subtract, multiply, and divide. 	2	2	0
Control Analog to Digital Conversion	<ol style="list-style-type: none"> Debug microcontroller programming to collect and digitize analog input data. 	2	2	0
Control Digital to Analog Conversion	<ol style="list-style-type: none"> Debug microcontroller programming to convert information from digital form to an analog output. 	5	5	0
Interface Considerations	<ol style="list-style-type: none"> Describe and measure rise and fall time, delay, loading characteristics, and interfacing requirements. Connect interface circuits to limit current and provide desired voltage levels. 	5	5	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
30	30	0