

# Electrical Systems Technology

This curriculum is designed to provide training for persons interested in installing and maintaining electrical systems found in residential, commercial, and industrial facilities. The Electrical Systems Technology (EST) curriculum is separated into three categories: Solar, Design, and Manufacturing Automation Troubleshooting/Maintenance. The solar degree prepares graduates for a career in installation, electrical code (NEC), maintenance, and solar equipment design on a residential, commercial or larger industry level. The design degree prepares graduates for a career in installing, designing, estimating, or testing residential, commercial, and industrial fields. The electrical manufacturing maintenance degree prepares graduates for a career in industries that require machine electrical repair skills on industrial and manufacturing machinery.

Coursework, most of which is hands-on, includes AC/DC theory, basic wiring practices, programmable logic controllers, industrial motor controls, applications of the National Electric Code, and other subjects, as local needs require.

The program offers various certificates that focus on courses to specialize in solar, residential, industrial, and manufacturing maintenance. Students also may complete certificate programs in HVAC controls and HVAC facilities maintenance, which are integrated within the Air Conditioning, Heating, and Refrigeration program.

For specific information about potential positions and wages in electrical systems technology, visit the Central Piedmont Career Coach website.

## Electrical Systems Technology (A35130)

### Degree Awarded

The Associate in Applied Science Degree – Electrical Systems Technology is awarded by the college upon completion of this program.

- Electrical Systems Technology - Electrical Design Track (A35130D) (p. 1)
- Electrical Systems Technology - Manufacturing Maintenance Technician Track (A35130M) (p. 2)
- Electrical Systems Technology - Solar Photovoltaic Track (A35130S) (p. 2)

### Admissions

- Completion of the high school diploma or equivalent is required.
- Many courses have prerequisites or co-requisites; check the Course Descriptions section for details.

### Contact Information

The Electrical Systems Technology program is in the Skilled Trades Division. For more information, call the program office at 704.330.4458 or the Skilled Trades Division at 704.330.4424.

## Electrical Systems Technology - Electrical Design Track (A35130D)

### General Education Requirements

ENG 111	Writing and Inquiry	3.0
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ENG 112	Writing and Research in the Disciplines	3.0
COM 231	Public Speaking	3.0
Select one of the following:		3.0

MAT 110	Mathematical Measurement and Literacy	
MAT 143	Quantitative Literacy	
MAT 171	Precalculus Algebra	

Select one of the following: 3.0

ART 111	Art Appreciation	
ART 114	Art History Survey I	
ART 115	Art History Survey II	

HUM 120	Cultural Studies	
HUM 130	Myth in Human Culture	
MUS 110	Music Appreciation	

MUS 112	Introduction to Jazz	
PHI 215	Philosophical Issues	
PHI 240	Introduction to Ethics	

Select one of the following: 3.0

ECO 251	Principles of Microeconomics	
ECO 252	Principles of Macroeconomics	
HIS 111	World Civilizations I	

HIS 112	World Civilizations II	
HIS 131	American History I	
HIS 132	American History II	

POL 120	American Government	
PSY 150	General Psychology	
SOC 210	Introduction to Sociology	

### Major Requirements

ACA 122	College Transfer Success	1.0
ARC 114	Architectural CAD	2.0
ARC 225	Architectural Building Information Modeling I	2.0

ELC 112	DC/AC Electricity	5.0
ELC 113	Residential Wiring	4.0
ELC 114	Commercial Wiring	4.0

ELC 115	Industrial Wiring	4.0
ELC 117	Motors and Controls	4.0
ELC 118	National Electrical Code	2.0

ELC 119	NEC Calculations	2.0
ELC 121	Electrical Estimating	2.0
ELC 125	Diagrams and Schematics	2.0

ELC 128	Introduction to Programmable Logic Controller	3.0
ELC 234	Electrical System Design	3.0
BPR 130	Print Reading-Construction	3.0

WOL 110	Basic Construction Skills	3.0
Select 3.0 credit from the following:		3.0
WBL 110	World of Work	

ARC 220	Advanced Architectural CAD	
WBL 111	Work-Based Learning I	
WBL 121	Work-Based Learning II	

ELC 111	Introduction to Electricity	
ELC 130	Advanced Motors and Controls	
ELC 215	Electrical Maintenance	

ELC 220	Photovoltaic System Technology	
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ELC 228	Programmable Logic Controllers Applications	
AHR 110	Introduction to Refrigeration	
Total Credits		67

**Electrical Systems Technology - Manufacturing Maintenance Technician Track (A35130M)**

**General Education Requirements**

ENG 111	Writing and Inquiry	3.0
ENG 112	Writing and Research in the Disciplines	3.0
COM 231	Public Speaking	3.0
Select one of the following:		3.0

MAT 110	Mathematical Measurement and Literacy	
MAT 143	Quantitative Literacy	
MAT 171	Precalculus Algebra	

Select one of the following: 3.0

ART 111	Art Appreciation	
ART 114	Art History Survey I	
ART 115	Art History Survey II	
HUM 120	Cultural Studies	
HUM 130	Myth in Human Culture	
MUS 110	Music Appreciation	
MUS 112	Introduction to Jazz	
PHI 215	Philosophical Issues	
PHI 240	Introduction to Ethics	
REL 110	World Religions	

Select one of the following: 3.0

ECO 251	Principles of Microeconomics	
ECO 252	Principles of Macroeconomics	
HIS 111	World Civilizations I	
HIS 112	World Civilizations II	
HIS 131	American History I	
HIS 132	American History II	
POL 120	American Government	
PSY 150	General Psychology	
SOC 210	Introduction to Sociology	

**Major Requirements**

ACA 122	College Transfer Success	1.0
ARC 114	Architectural CAD	2.0
ARC 225	Architectural Building Information Modeling I	2.0
ELC 112	DC/AC Electricity	5.0
ELC 113	Residential Wiring	4.0
ELC 114	Commercial Wiring	4.0
ELC 117	Motors and Controls	4.0
ELC 118	National Electrical Code	2.0
ELC 119	NEC Calculations	2.0
ELC 121	Electrical Estimating	2.0
ELC 125	Diagrams and Schematics	2.0
ELC 128	Introduction to Programmable Logic Controller	3.0
ELC 130	Advanced Motors and Controls	3.0
ELC 215	Electrical Maintenance	3.0
ELC 228	Programmable Logic Controllers Applications	4.0
WOL 110	Basic Construction Skills	3.0

WLD 112	Basic Welding Processes	2.0
Select 3.0 credits from the following:		3.0

WBL 110	World of Work	
WBL 111	Work-Based Learning I	
WBL 121	Work-Based Learning II	
ELC 111	Introduction to Electricity	
ELC 115	Industrial Wiring	
ELC 220	Photovoltaic System Technology	
ELC 234	Electrical System Design	
BPR 130	Print Reading-Construction	
AHR 110	Introduction to Refrigeration	

Total Credits 69

**Electrical Systems Technology - Solar Photovoltaic Track (A35130S)**

**General Education Requirements**

ENG 111	Writing and Inquiry	3.0
ENG 112	Writing and Research in the Disciplines	3.0
COM 231	Public Speaking	3.0
Select one of the following:		3.0

MAT 110	Mathematical Measurement and Literacy	
MAT 143	Quantitative Literacy	
MAT 171	Precalculus Algebra	

Select one of the following: 3.0

ART 111	Art Appreciation	
ART 114	Art History Survey I	
ART 115	Art History Survey II	
HUM 120	Cultural Studies	
HUM 130	Myth in Human Culture	
MUS 110	Music Appreciation	
MUS 112	Introduction to Jazz	
PHI 215	Philosophical Issues	
PHI 240	Introduction to Ethics	
REL 110	World Religions	

Select one of the following: 3.0

ECO 251	Principles of Microeconomics	
ECO 252	Principles of Macroeconomics	
HIS 111	World Civilizations I	
HIS 112	World Civilizations II	
HIS 131	American History I	
HIS 132	American History II	
POL 120	American Government	
PSY 150	General Psychology	
SOC 210	Introduction to Sociology	

**Major Requirements**

ACA 122	College Transfer Success	1.0
ARC 114	Architectural CAD	2.0
ARC 225	Architectural Building Information Modeling I	2.0
ELC 112	DC/AC Electricity	5.0
ELC 113	Residential Wiring	4.0
ELC 114	Commercial Wiring	4.0
ELC 117	Motors and Controls	4.0

ELC 118	National Electrical Code	2.0
ELC 119	NEC Calculations	2.0
ELC 121	Electrical Estimating	2.0
ELC 125	Diagrams and Schematics	2.0
ELC 128	Introduction to Programmable Logic Controller	3.0
WOL 110	Basic Construction Skills	3.0
ELC 130	Advanced Motors and Controls	3.0
ELC 220	Photovoltaic System Technology	3.0
ELC 234	Electrical System Design	3.0
Select 3.0 credits from the following:		3.0
WBL 110	World of Work	
WBL 111	Work-Based Learning I	
WBL 121	Work-Based Learning II	
ELC 111	Introduction to Electricity	
ELC 115	Industrial Wiring	
ELC 215	Electrical Maintenance	
ELC 228	Programmable Logic Controllers Applications	
BPR 130	Print Reading-Construction	
AHR 110	Introduction to Refrigeration	
Total Credits		66

## No diplomas are offered in Electrical Systems Technology.

### Electrical Systems Technology Certificates (C35130)

The certificates listed below can be earned in the Electrical Systems Technology (A35130) program:

- Electrical Systems Technology Certificate Specialization in Fast Track Residential Wiring (C35130-30) (p. 3)
- Electrical Systems Technology Certificate Specialization in Fast Track Commercial and Industrial Wiring (C35130-31) (p. 3)
- Electrical Systems Technology Certificate Specialization in Electrician Assistant Level I (C35130-32) (p. 3)
- Electrical Systems Technology Certificate Specialization in Electrician Assistant Level II (C35130-33) (p. 3)
- Electrical Systems Technology Certificate Specialization in Electrical AHR Controls and Facilities Maintenance Level I (C35130-34) (p. 4)
- Electrical Systems Technology Certificate Specialization in Electrical AHR Controls and Facilities Maintenance Level II (C35130-35) (p. 4)
- Electrical Systems Technology Certificate Specialization in Solar Photovoltaic (C35130-36) (p. 2)
- Electrical Systems Technology Certificate Specialization in Electrical Manufacturing Maintenance Technician Level I (C35130-37) (p. 4)
- Electrical Systems Technology Certificate Specialization in Electrical Manufacturing Maintenance Technician Level II (35130-38) (p. 4)
- Electrical Systems Technology Certificate Specialization in Fast Track Electrical Construction (C35130-54) (p. 4)

### Admissions

- Completion of a high school diploma or equivalent is required as the foundation of a career in this area.

- Many courses have prerequisites or co-requisites; check the Course Descriptions section for details.

### Contact Information

The Electrical Systems Technology program is in the Skilled Trades Division. For more information, call the program office at 704.330.4458 or the Construction Technologies Division at 704.330.4408.

### Electrical Systems Technology Certificate Specialization in Fast Track Residential Wiring (C35130-30)

#### Major Requirements

ELC 112	DC/AC Electricity	5.0
ELC 113	Residential Wiring	4.0
ELC 118	National Electrical Code	2.0
ELC 119	NEC Calculations	2.0
BPR 130	Print Reading-Construction	3.0
Total Credits		16

### Electrical Systems Technology Certificate Specialization in Fast Track Commercial and Industrial Wiring (C35130-31)

#### Major Requirements

ELC 112	DC/AC Electricity	5.0
ELC 114	Commercial Wiring	4.0
ELC 118	National Electrical Code	2.0
ELC 119	NEC Calculations	2.0
ELC 115	Industrial Wiring	4.0
Total Credits		17

### Electrical Systems Technology Certificate Specialization in Electrician Assistant Level I (C35130-32)

#### Major Requirements

ELC 118	National Electrical Code	2.0
ELC 119	NEC Calculations	2.0
ELC 113	Residential Wiring	4.0
ELC 112	DC/AC Electricity	5.0
ARC 225	Architectural Building Information Modeling I	2.0
WOL 110	Basic Construction Skills	3.0
Total Credits		18

### Electrical Systems Technology Certificate Specialization in Electrician Assistant Level II (C35130-33)

#### Major Requirements

ELC 234	Electrical System Design	3.0
ELC 114	Commercial Wiring	4.0
ELC 115	Industrial Wiring	4.0
ARC 114	Architectural CAD	2.0
BPR 130	Print Reading-Construction	3.0

WBL 111M	Work-Based Learning I Experience	1.0
Total Credits		17

**Electrical Systems Technology Certificate Specialization in Electrical AHR Controls and Facilities Maintenance Level I (C35130-34)**

Major Requirements

AHR 110	Introduction to Refrigeration	5.0
BPR 130	Print Reading-Construction	3.0
ELC 111	Introduction to Electricity	3.0
ELC 115	Industrial Wiring	4.0
ELC 125	Diagrams and Schematics	2.0
Total Credits		17

**Electrical Systems Technology Certificate Specialization in Electrical AHR Controls and Facilities Maintenance Level II (C35130-35)**

AHR 130	HVAC Controls	3.0
AHR 215	Commercial HVAC Controls	2.0
AHR 263	Energy Management	2.0
ELC 117	Motors and Controls	4.0
ELC 128	Introduction to Programmable Logic Controller	3.0
ELC 228	Programmable Logic Controllers Applications	4.0
Total Credits		18

**Electrical Systems Technology Certificate Specialization in Solar Photovoltaic (C35130-36)**

Major Requirements

ELC 112	DC/AC Electricity	5.0
ELC 118	National Electrical Code	2.0
ELC 119	NEC Calculations	2.0
ELC 220	Photovoltaic System Technology	3.0
Total Credits		12

**Electrical Systems Technology Certificate Specialization in Electrical Manufacturing Maintenance Technician Level I (C35130-37)**

Major Requirements

ELC 112	DC/AC Electricity	5.0
ELC 117	Motors and Controls	4.0
ELC 125	Diagrams and Schematics	2.0
ELC 128	Introduction to Programmable Logic Controller	3.0
WLD 121	GMAW (MIG) FCAW/Plate	4.0
Total Credits		18

**Electrical Systems Technology Certificate Specialization in Electrical Manufacturing Maintenance Technician Level II (C35130-38)**

Major Requirements

ELC 130	Advanced Motors and Controls	3.0
ELC 215	Electrical Maintenance	3.0
ELC 228	Programmable Logic Controllers Applications	4.0

ELC 234	Electrical System Design	3.0
WOL 110	Basic Construction Skills	3.0
WLD 112	Basic Welding Processes	2.0
Total Credits		18

**Electrical Systems Technology Certificate Specialization in Fast Track Electrical Construction (C35130-54)**

Major Requirements

ELC 112	DC/AC Electricity	5.0
ELC 113	Residential Wiring	4.0
ELC 114	Commercial Wiring	4.0
ELC 118	National Electrical Code	2.0
ELC 119	NEC Calculations	2.0
WBL 121M	Work-Based Learning II	1.0
Total Credits		18

The following is the suggested plan for when to take each course to complete the Associate in Applied Science degree, based on the program requirements of the 2022-2023 catalog. This is only a recommendation — you may take courses in another order upon consultation with your advisor. This plan is based on you starting with college-level math and English courses, starting your program in the fall, and attending full-time. You can also follow this sequence if you attend part-time. Speak with an advisor about the plan and any questions. This program might also offer diplomas or certificates; visit the catalog or contact the program for details.

Electrical Systems Technology Electrical Design suggested course sequence

Electrical Systems Technology - Manufacturing maintenance suggested course sequence

Electrical Systems Technology - Solar photovoltaic suggested course sequence