

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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COM 231	Public Speaking	3.0
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Select one of the following: 3.0

MAT 110	Mathematical Measurement and Literacy
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MAT 143	Quantitative Literacy
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MAT 171	Precalculus Algebra
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Select one of the following: 3.0

ART 111	Art Appreciation
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ART 114	Art History Survey I
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ART 115	Art History Survey II
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HUM 120	Cultural Studies
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HUM 130	Myth in Human Culture
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MUS 110	Music Appreciation
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MUS 112	Introduction to Jazz
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PHI 215	Philosophical Issues
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PHI 240	Introduction to Ethics
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Select one of the following: 3.0

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

ACA 122	College Transfer Success	1.0
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ARC 114	Architectural CAD	2.0
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ARC 225	Architectural Building Information Modeling I	2.0
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ELC 112	DC/AC Electricity	5.0
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ELC 113	Residential Wiring	4.0
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ELC 114	Commercial Wiring	4.0
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ELC 115	Industrial Wiring	4.0
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ELC 117	Motors and Controls	4.0
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ELC 118	National Electrical Code	2.0
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ELC 119	NEC Calculations	2.0
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ELC 121	Electrical Estimating	2.0
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ELC 125	Diagrams and Schematics	2.0
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ELC 128	Introduction to Programmable Logic Controller	3.0
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ELC 234	Electrical System Design	3.0
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BPR 130	Print Reading-Construction	3.0
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WOL 110	Basic Construction Skills	3.0
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Select 3.0 credit from the following: 3.0

WBL 111	Work-Based Learning I
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WBL 121	Work-Based Learning II
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ELC 130	Advanced Motors and Controls
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ELC 215	Electrical Maintenance
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ELC 220	Photovoltaic System Technology
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ALT 120	Renewable Energy Technologies
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SST 130	Modeling Renewable Energy
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ELC 228	Programmable Logic Controllers Applications	
Total Credits		64

Electrical Systems Technology - Manufacturing Maintenance Technician Track (A35130M)

General Education Requirements

ENG 111	Writing and Inquiry	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

ELC 115	Industrial Wiring	
ELC 127	Software for Technicians	
ELC 213	Instrumentation	
ELC 234	Electrical System Design	
ELC 220	Photovoltaic System Technology	
WBL 111	Work-Based Learning I	
WBL 121	Work-Based Learning II	
Total Credits		66

Electrical Systems Technology - Solar Photovoltaic Track (A35130S)

General Education Requirements

ENG 111	Writing and Inquiry	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 4.0 credits from the following:		4.0
ALT 120	Renewable Energy Technologies	
SST 130	Modeling Renewable Energy	
ELC 115	Industrial Wiring	
ELC 215	Electrical Maintenance	
BPR 130	Print Reading-Construction	
Total Credits		64

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 Level I - Residential Electrical (C35130-32) (p.)
- Electrical Systems Technology Certificate Specialization in Level II - Commercial Electrical (C35130-33) (p.)
- Electrical Systems Technology Certificate Specialization in Solar Photovoltaic - Level I (C35130-36) (p. 2)
- Electrical Systems Technology Certificate Specialization in Level III - Electrical Maintenance I (C35130-40) (p.)
- Electrical Systems Technology Certificate Specialization in Level IV - Electrical Maintenance II (C35130-41) (p.)

Admissions

- Completion of a high school diploma or equivalent is encouraged 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](tel:704.330.4458) or [the Construction Technologies Division at 704.330.4408](tel:704.330.4408).

Electrical Systems Technology Certificate Specialization in Level I - Residential Electrical (C35130-32)

Major Requirements

WOL 110	Basic Construction Skills	3.0
ELC 112	DC/AC Electricity	5.0
ELC 113	Residential Wiring	4.0
ELC 118	National Electrical Code	2.0
BPR 130	Print Reading-Construction	3.0
Total Credits		17

Electrical Systems Technology Certificate Specialization in Level II - Commercial Electrical(C35130-33)

Major Requirements

ELC 114	Commercial Wiring	4.0
ELC 117	Motors and Controls	4.0
ELC 119	NEC Calculations	2.0
ELC 125	Diagrams and Schematics	2.0
ELC 128	Introduction to Programmable Logic Controller	3.0
Total Credits		15

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

Major Requirements

ELC 112	DC/AC Electricity	5.0
ELC 113	Residential Wiring	4.0
ALT 120	Renewable Energy Technologies	3.0
ELC 118	National Electrical Code	2.0
ELC 220	Photovoltaic System Technology	3.0
Total Credits		17

Electrical Systems Technology Certificate Specialization in Level III - Electrical Maintenance (C35130-40)

Major Requirements

ELC 115	Industrial Wiring	4.0
ELC 130	Advanced Motors and Controls	3.0
ELC 215	Electrical Maintenance	3.0
ELC 121	Electrical Estimating	2.0
Total Credits		12

Electrical Systems Technology Certificate Specialization in Level IV - Electrical Maintenance II (C35130-41)

Major Requirements

ELC 228	Programmable Logic Controllers Applications	4.0
ELC 234	Electrical System Design	3.0
ARC 225	Architectural Building Information Modeling I	2.0
WLD 112	Basic Welding Processes	2.0
WBL 111	Work-Based Learning I	1.0
Total Credits		12

Electrical Systems Technology Suggested Course Sequences

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 2024-2025 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

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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 Track (A35130D) (p. 4)
- Electrical Systems Technology - Manufacturing Maintenance Technician Track (A35130M) (p. 2)
- Electrical Systems Technology - Solar Photovoltaic Track (A35130S) (p. 4)

Electrical Systems Technology - Electrical Design Track (A35130D)

Term I		Credits
MAT 110	Mathematical Measurement and Literacy	3.0
ACA 122	College Transfer Success	1.0
ELC 112	DC/AC Electricity	5.0
ELC 113	Residential Wiring	4.0
WOL 110	Basic Construction Skills	3.0
Credits		16
Term II		Credits
BPR 130	Print Reading-Construction	3.0
ELC 114	Commercial Wiring	4.0
ELC 117	Motors and Controls	4.0
ELC 125	Diagrams and Schematics	2.0
ELC 128	Introduction to Programmable Logic Controller	3.0
Credits		16
Term III		Credits
ENG 111	Writing and Inquiry	3.0
Credits		3
Term IV		Credits
ARC 114	Architectural CAD	2.0
ELC 115	Industrial Wiring	4.0
ELC 121	Electrical Estimating	2.0
ELC 118	National Electrical Code	2.0
ELC 119	NEC Calculations	2.0
Humanities/Fine Arts		3.0
You may have completed a program certificate(s). Confirm eligibility with your academic advisor.		
Credits		15
Term V		Credits
ARC 225	Architectural Building Information Modeling I	2.0
ELC 234	Electrical System Design	3.0
Behavioral/Social Science		3.0
Technical Elective		3.0
COM 231	Public Speaking	3.0
You may have completed a program certificate(s). Confirm eligibility with your academic advisor.		
Credits		14
Total Credits		64

Electrical Systems Technology - Manufacturing Maintenance Technician Track (A35130M)

Term I		Credits
ACA 122	College Transfer Success	1.0
MAT 110	Mathematical Measurement and Literacy	3.0
ELC 112	DC/AC Electricity	5.0
ELC 113	Residential Wiring	4.0
WOL 110	Basic Construction Skills	3.0
Credits		16
Term II		Credits
ELC 114	Commercial Wiring	4.0
ELC 117	Motors and Controls	4.0

ELC 125	Diagrams and Schematics	2.0
ELC 128	Introduction to Programmable Logic Controller	3.0
ENG 111	Writing and Inquiry	3.0
Credits		16
Term III		Credits
Humanities/Fine Arts		3.0
Credits		3
Term IV		Credits
ARC 114	Architectural CAD	2.0
ELC 118	National Electrical Code	2.0
ELC 119	NEC Calculations	2.0
ELC 121	Electrical Estimating	2.0
ELC 215	Electrical Maintenance	3.0
WLD 112	Basic Welding Processes	2.0
Behavioral/Social Science		3.0
You may have completed a program certificate(s). Confirm eligibility with your academic advisor.		
Credits		16
Term V		Credits
ARC 225	Architectural Building Information Modeling I	2.0
ELC 130	Advanced Motors and Controls	3.0
ELC 228	Programmable Logic Controllers Applications	4.0
Technical Elective		3.0
COM 231	Public Speaking	3.0
You may have completed a program certificate(s). Confirm eligibility with your academic advisor.		
Credits		15
Total Credits		66

Electrical Systems Technology - Solar Photovoltaic Track (A35130S)

Term I		Credits
MAT 110	Mathematical Measurement and Literacy	3.0
ACA 122	College Transfer Success	1.0
ELC 112	DC/AC Electricity	5.0
ELC 113	Residential Wiring	4.0
WOL 110	Basic Construction Skills	3.0
Credits		16
Term II		Credits
ELC 114	Commercial Wiring	4.0
ELC 117	Motors and Controls	4.0
ELC 125	Diagrams and Schematics	2.0
ELC 128	Introduction to Programmable Logic Controller	3.0
ENG 111	Writing and Inquiry	3.0
Credits		16
Term III		Credits
Technical Elective		1.0
Credits		1
Term IV		Credits
ARC 114	Architectural CAD	2.0
ELC 118	National Electrical Code	2.0
ELC 119	NEC Calculations	2.0
ELC 121	Electrical Estimating	2.0
COM 231	Public Speaking	3.0
ELC 220	Photovoltaic System Technology	3.0
You may have completed a program certificate(s). Confirm eligibility with your academic advisor.		
Credits		14
Term V		Credits
ARC 225	Architectural Building Information Modeling I	2.0
Humanities/Fine Arts		3.0

Behavioral/Social Science		3.0
ELC 130	Advanced Motors and Controls	3.0
ELC 234	Electrical System Design	3.0
Technical Elective		3.0
You may have completed a program certificate(s). Confirm eligibility with your academic advisor.		
	Credits	17
	Total Credits	64