CENTRAL CAROLINA COMMUNITY COLLEGE

Applied Technologies

Program Planning Guide

Electrical Systems Technology Associate in Applied Science Degree (A35130)

Program Length: 5 semesters
Program Sites: Chatham Main Campus
Career Pathway Options: Associate in Applied Science Degree in Electrical Systems Technology

Suggested Course Schedule		Class	Lab	Work	Credits	Notes:
1st Semester (fall)						
ELC 112	DC/AC Electricity	3	6	0	5	
ELC 113	Residential Wiring	2	6	0	4	
ELC 118	National Electrical Code	1	2	0	2	
ISC 112	Industrial Safety	2	0	0	2	
ACA 122	College Transfer Success	0	2	0	1	
	Total Semester Hours	**8**	**16**	**0**	**14**	
2nd Semester (spring)						
ELC 114	Commercial Wiring	2	6	0	4	
ELC 117	Motors and Controls	2	6	0	4	
ELC 119	NEC Calculations	1	2	0	2	
ELN 131	Analog Electronics I	3	`3	0	4	
	Total Semester Hours	**8**	**17**	**0**	**14**	
3rd Semester (summer)						
ELC 127	Software for Technicians	1	3	0	2	
ELC 121	Electrical Estimating	1	2	0	2	
MAT 110	Math Measurement & Literacy	2	2	0	3	
Humanities/Fine Arts Electives		3	0	0	3	
English, select one:		3	0	0	3	
ENG 110	Freshman Composition					
ENG 111	Writing and Inquiry					
	Total Semester Hours	**13**	**7**	**0**	**13**	

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4th Semester (fall)						
BPR 130	Print Reading - Construction	3	0	0	3	
ELC 128	Intro to PLC	2	3	0	3	
ALT 120	Renewable Energy Tech	2	2	0	3	
ELC 122	Advanced Residential Wiring	2	4	0	4	
	Total Semester Hours	**9**	**9**	**0**	**13**	
5th Semester (spring)						
ELC 220	Photovoltaic Sys Tech	2	3	0	3	
BUS 110	Introduction to Business	3	0	0	3	
WBL 111	Work-Based Learning	0	0	10	1	
Social/Behavioral Science Elective		3	0	0	3	
Communications Elective		3	0	0	3	
	Total Semester Hours	**11**	**3**	**10**	**13**	
Total Semester Hours Required for Graduation: 67						

Approved Humanities/Fine Arts Electives **Associate in Applied Science Degree/Diploma**	
ART 111	Art Appreciation
ART 114	Art History Survey I
ART 115	Art History Survey II
DRA 111	Theatre Appreciation
ENG 125	Creative Writing I
ENG 231	American Literature I
ENG 232	American Literature II
ENG 241	British Literature I
ENG 242	British Literature II
HUM 110	Technology & Society
HUM 115	Critical Thinking
HUM 120	Cultural Studies
HUM 122	Southern Culture
HUM 150	American Women's Studies
HUM 160	Introduction to Film
MUS 110	Music Appreciation
MUS 112	Introduction to Jazz
PHI 240	Introduction to Ethics
REL 110	World Religions
REL 211	Intro to Old Testament
REL 212	Intro to New Testament
Communications, select one:	
ENG 112	Writing/Research in the Disc
ENG 114	Prof Research & Reporting
ENG 115	Oral Communication
ENG 116	Technical Report Writing
COM 110	Introduction to Communication
COM 120	Intro Interpersonal Communication
COM 231	Public Speaking

Approved Social/Behavioral Science Electives **Associate in Applied Science Degree/Diploma**	
ANT 210	General Anthropology
ANT 220	Cultural Anthropology
ECO 151	Survey of Economics
ECO 251	Principles of Microeconomics
ECO 252	Principles of Macroeconomics
HIS 111	World Civilization I
HIS 112	World Civilization II
HIS 131	American History I
HIS 132	American History II
HIS 222	African-American History I
HIS 223	African-American History II
HIS 226	The Civil War
HIS 236	North Carolina History
POL 120	American Government
PSY 150	General Psychology
PSY 237	Social Psychology
PSY 241	Developmental Psychology
PSY 246	Adolescent Psychology
PSY 281	Abnormal Psychology
SOC 210	Introduction to Sociology
SOC 213	Sociology of the Family
SOC 220	Social Problems
SOC 225	Social Diversity
SOC 232	Social Context of Aging
SOC 240	Social Psychology

Course Descriptions

ACA 122 College Transfer Success
This course provides information and strategies necessary to develop clear academic and professional goals beyond the community college experience. Topics include the CAA, college policies and culture, career exploration, gathering information on senior institutions, strategic planning, critical thinking, and communications skills for a successful academic transition. Upon completion, students should be able to develop an academic plan to transition successfully to senior institutions. This course has been approved for transfer under the CAA/ICAA as a premajor and/or elective course requirement.

ALT 120 Renewable Energy Technologies
This course provides an introduction to multiple technologies that allow for the production and conservation of energy from renewable sources. Topics include hydro-electric, wind power, passive and active solar energy, tidal energy, appropriate building techniques, and energy conservation methods. Upon completion, students should be able to demonstrate an understanding of renewable energy production and its impact on humans and their environment.

BPR 130 Print Reading-Construction
This course covers the interpretation of prints and specifications that are associated with design and construction projects. Topics include interpretation of documents for foundations, floor plans, elevations, and related topics. Upon completion, students should be able to read and interpret construction prints and documents.

BUS 110 Introduction to Business
This course provides a survey of the business world. Topics include the basic principles and practices of contemporary business. Upon completion, students should be able to demonstrate an understanding of business concepts as a foundation for studying other business subjects. This course has been approved for transfer under the CAA and ICAA as a premajor and/or elective course requirement

ELC 112 DC/AC Electricity
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 113 Residential Wiring
This course introduces the care/usage of tools and materials used in residential electrical installations and the requirements of the National Electrical Code. Topics include NEC, electrical safety, and electrical print reading; planning, layout, and installation of electrical distribution equipment; lighting; overcurrent protection; conductors; branch circuits; and conduits. Upon completion, students should be able to properly install conduits, wiring, and electrical distribution equipment associated with basic electrical installations.

ELC 114 Commercial Wiring
This course provides instruction in the application of electrical tools, materials, and test equipment associated with electrical installations. Topics include the NEC; safety; electrical blueprints; planning, layout, and installation of equipment and conduits; and wiring devices such as panels and overcurrent devices. Upon completion, students should be able to properly install equipment and conduit associated with electrical installations.

ELC 117 Motors and Controls
Local Prerequisites: ELC 112
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 118 National Electrical Code
This course covers the use of the current National Electrical Code. Topics include the NEC history, wiring methods, overcurrent protection, materials, and other related topics. Upon completion, students should be able to effectively use the NEC.

ELC 119 NEC Calculations
This course covers branch circuit, feeder, and service calculations. Emphasis is placed on sections of the National Electrical Code related to calculations. Upon completion, students should be able to use appropriate code sections to size wire, conduit, and overcurrent devices for branch circuits, feeders, and service.

ELC 121 Electrical Estimating
Local Prerequisites: ELC 113
This course covers the principles involved in estimating electrical projects. Topics include take-offs of materials and equipment, labor, overhead, and profit. Upon completion, students should be able to estimate simple electrical projects.

ELC 122 Advanced Residential Wiring
Prerequisites: ELC 113
This course introduces advanced topics in residential electrical installations including the requirements of the National Electrical Code (NEC). Topics include NEC, special purpose outlets, telephone and low voltage signal systems, swimming pool electrical systems, home automation systems, standby power systems and residential utility-interactive photovoltaic systems. Upon completion, students should be able to properly install conduits, wiring, electrical distribution equipment, low voltage, standby power, automated systems, and utility-interactive photovoltaic systems associated with advanced residential electrical installations.

ELC 127 Software for Technicians
This course introduces computer software which can be used to solve electrical/electronics problems. Topics include electrical/electronics calculations and applications. Upon completion, students should be able to utilize a personal computer for electrical/electronics-related applications.

ELC 128 Introduction to PLC
Local Prerequisite: ELC 112 AND ELC 117 or Permission of Instructor
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 PLC systems and create simple programs.

ELC 220 Photovoltaic Sys Tech
This course introduces the concepts, tools, techniques, and materials needed to understand systems that convert solar energy into electricity with photovoltaic (pv) technologies. Topics include site analysis for system integration, building codes, and advances in photovoltaic technology. Upon completion, students should be able to demonstrate an understanding of the principles of photovoltaic technology and current applications.

ELN 131 Analog Electronics I
Local Prerequisite: ELC 112 or ELC 131
This course introduces the characteristics and applications of semiconductor devices and circuits. Emphasis is placed on analysis, selection, biasing, and applications. Upon completion, students should be able to construct, analyze, verify, and troubleshoot analog circuits using appropriate techniques and test equipment.

ENG 110 Freshman Composition
Prerequisites: ENG 002 P1 grade
This course is designed to develop informative and business writing skills. Emphasis is placed on logical organization of writing, including effective introductions and conclusions, precise use of grammar, and appropriate selection and use of sources. Upon completion, students should be able to produce clear, concise, well-organized short papers.

ENG 111 Writing and Inquiry
Corequisite ENG 011
Prerequisites: ENG 002 P1 grade and ENG 011
This course is designed to develop the ability to produce clear writing in a variety of genres and formats using a recursive process. Emphasis includes inquiry, analysis, effective use of rhetorical strategies, thesis development, audience awareness, and revision. Upon completion, students should be able to produce unified, coherent, well-developed essays using standard written English. This course has been approved for transfer under the CAA and ICAA as a universal general education transfer component (UGETC) course in English Composition.

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

MAT 110 Math Measurement & Literacy
Prerequisite: Take one set: Set 1: DMA 010 DMA 020, DMA 030; Set 2: DMA 025; Set 3: MAT 003; Set 4: BSP 4003
Corequisite: Take MAT 010
This course provides an activity-based approach that develops measurement skills and mathematical literacy using technology to solve problems for non-math intensive programs. Topics include unit conversions and estimation within a variety of measurement systems; ratio and proportion; basic geometric concepts; financial literacy; and statistics including measures of central tendency, dispersion, and charting of data. Upon completion, students should be able to demonstrate the use of mathematics and technology to solve practical problems, and to analyze and communicate results.

WBL 111 Work-Based Learning I
Local Prerequisite: Approval of Instructor or Department Chairperson
This course provides a work-based learning experience with a college-approved employer in an area related to the student's program of study. Emphasis is placed on integrating classroom learning with related work experience. Upon completion, students should be able to evaluate career selection, demonstrate employability skills, and satisfactorily perform work-related competencies.