CENTRAL CAROLINA
COMMUNITY COLLEGE

Program Planning Guide
Electronics Engineering Technology, Associate in Applied Science Degree, A40200

Program Length: 5 Semesters
Career Pathway Options: Associate in Applied Science Degree in Electronics Engineering Technology
Program Site/s: Lee Main Campus-Day Program

Suggested Course Schedule:		Hours				Notes:
		Class	Lab	Clinical	Credit	
1st Semester (Fall)						
ACA 122	Student Success Course				1	
CIS 110	Intro to Computers	2	2	0	3	
EGR 131	Introduction to Electronics Tech	1	2	0	2	
ELC 131	Circuit Analysis I	3	3	0	4	
ELC 131A	Circuit Analysis I Lab	0	3	0	1	
ENG 111	Writing & Inquiry	3	0	0	3	
MAT 171 **OR**	Precalculus Algebra	3	2	0		
MAT 121	Algebra/Trigonometry I	2	2	0	3	
					17	or 18
2nd Semester (Spring)						
ELN 131	Analog Electronics I	3	3	0	4	
ELN 133	Digital Electronics	3	3	0	4	
MAT 172 **OR**	Precalculus Trigonometry	3	2	0		
MAT 122	Algebra/Trigonometry II	2	2	0	3	
PHY 151 **OR**	College Physics I	3	2	0	4	
PHY 131	Physics - Mechanics	3	2	0		
					15	or 16
3rd Semester (Summer)						
ELN 132	Analog Electronics II	3	3	0	4	
PHY 152 **OR**	College Physics II	3	2	0	4	
PHY 133	Physics - Sound & Light	3	2	0		
					8	
4th Semester (Fall)						
CET 225	Digital Signal Processing	2	2	0	3	
ELN 232	Introduction to Microprocessors	3	3	0	4	
	Technical Elective				3	
Communications Elective		3	0	0	3	recommend ENG 112
Social/Behavioral Science Elective		3	0	0	3	
					16	
5th Semester (Spring)						
ELN 247	Electronic Applications Project	1	3	0	2	
ELN 275	Troubleshooting	1	3	0	2	
ISC 221	Statistical Quality Control	3	0	0	3	
PCI 170	DAQ and Control	3	3	0	4	
	Humanities/Fine Arts Elective	3	0	0	3	
ELC 128	Introduction to PLCs	2	3	0	3	
					17	

Communications Elective (Choose one)						
COM 231	Public Speaking	3	0	0	3	
ENG 112	Writing/Research in the Disciplines	3	0	0	3	
ENG 114	Professional Research & Reporting	3	0	0	3	
Technical Electives (Choose 3 SHC):						
CSC 134	C++ Programming	2	3	0	3	
CSC 151	JAVA Programming	2	3	0	3	
CTI 120	Network and SEC Foundations	2	2	0	3	
CTS 120	Hardware/Software Support	2	3	0	3	
DFT 151	CAD I	2	3	0	3	
LEO 111	Lasers and Applications	1	3	0	2	
ELC 213	Instrumentation	3	2	0	4	
ELN 236	Fiber Optics and Lasers	3	2	0	4	
CSC 121	Python Programming	2	3	0	3	
NOS 130	Windows Single User	2	2	0	3	

Total Semester Hours Credit Required for Graduation: 73

Electronic Engineering Technology, Associate in Applied Science Degree
Course Descriptions

ACA 122 College Transfer Success 0-2-1
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 and ICAA as a premajor and/or elective course requirement.

CET 225 Digital Signal Processing 2-2-3
Local Prerequisite: ELN 133
This course introduces concepts and applications of digital signal processing. Topics include Fourier analysis, signal sampling, digital filtering, IIR filters, FIR filters, and DSP programming. Upon completion, students should be able to implement and troubleshoot DSP systems in hardware and software.

CIS 110 Introduction to Computers 2-2-3
This course introduces computer concepts, including fundamental functions and operations of the computer. Topics include identification of hardware components, basic computer operations, security issues, and use of software applications. Upon completion, students should be able to demonstrate an understanding of the role and function of computers and use the computer to solve problems. This course has been approved for transfer under the CAA and ICAA as a general education course in Mathematics.

COM 231 Public Speaking 3-0-3
This course provides instruction and experience in preparation and delivery of speeches within a public setting and group discussion. Emphasis is placed on research, preparation, delivery, and evaluation of informative, persuasive, and special occasion public speaking. Upon completion, students should be able to prepare and deliver well-organized speeches and participate in group discussion with appropriate audiovisual support. This course has been approved for transfer under the CAA and ICAA as a universal general education transfer component (UGETC) course in Communications.

CSC 121 Python Programming 2-3-3
This course introduces computer programming using the Python programming language. Emphasis is placed on common algorithms and programming principles utilizing the standard library distributed with Python. Upon completion, students should be able to design, code, test, and debug Python language programs.

CSC 134 C++ Programming 2-3-3
This course introduces computer programming using the C++ programming language with object-oriented programming principles. Emphasis is placed on event-driven programming methods, including creating and manipulating objects, classes, and using object-oriented tools such as the class debugger. Upon completion, students should be able to design, code, test and debug at a beginning level. This course has been approved for transfer under the CAA and ICAA as a premajor and/or elective course requirement.

CSC 151 JAVA Programming 2-3-3
This course introduces computer programming using the JAVA programming language with object-oriented programming principles. Emphasis is placed on event-driven programming methods, including creating and manipulating objects, classes, and using object-oriented tools such as the class debugger. Upon completion students should be able to design, code, test, debug JAVA language programs. This course has been approved for transfer under the CAA and ICAA as a premajor and/or elective course requirement.

CTI 120 Network & Sec Foundation 2-2-3
This course introduces students to the Network concepts, including networking terminology and protocols, local and wide area networks, and network standards, Emphasis is placed on securing information systems and the various implementation policies. Upon completion, students should be able to perform basic tasks related to networking mathematics, terminology, media and protocols.

CTS 120 Hardware/Software Support 2-3-3
This course covers the basic hardware of a personal computer, including installation, operations and interactions with software. Topics include component identification, memory-system, peripheral installation and configuration, preventive maintenance, hardware diagnostics/repair, installation and optimization of system software, commercial programs, system configuration, and device-drivers. Upon completion, students should be able to select appropriate computer equipment and software, upgrade/maintain existing equipment and software, and troubleshoot/repair non-functioning personal computers.

DFT 151 CAD I 2-3-3
This course introduces CAD software as a drawing tool. Topics include drawing, editing, file management, and plotting. Upon completion, students should be able to produce and plot a CAD drawing.

EGR 131 Introduction To Electronics Technology 1-2-2
This course introduces the basic skills required for electrical/electronics technicians. Topics include soldering/desoldering, safety practices, test equipment, scientific calculators, AWG wire table, the resistor color code, electronic devices, problem solving, and use of hand tools. Upon completion, students should be able to solder/desolder, operate test equipment, apply problem solving techniques, and use a scientific calculator.

ELC 128 Introduction to PLC 2-3-3
Local Prerequisite: ELC 112 or ELC 131 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 131   Circuit Analysis I   3-3-4
Local Corequisite: Take one set: 1) MAT 121 and ELC 131A; 2) ELC 131A and MAT 171
This course introduces DC and AC electricity with an emphasis on circuit analysis, measurements, and operation of test equipment. Topics include DC and AC principles, circuit analysis laws and theorems, components, test equipment operation, circuit simulation, and other related topics. Upon completion, students should be able to interpret circuit schematics; design, construct, verify, and analyze DC/AC circuits; and properly use test equipment.

ELC 131A   Circuit Analysis I Lab   0-3-1
Corequisite: ELC 131
This course provides laboratory assignments as applied to fundamental principles of DC/AC electricity. Emphasis is placed on measurements and evaluation of electrical components, devices and circuits. Upon completion, the students will gain hands-on experience by measuring voltage, current, and opposition to current flow utilizing various meters and test equipment.

ELC 213   Instrumentation   3-2-4
Local Prerequisites: ELC 111, ELC 112, or ELC 131
This course covers the fundamentals of instrumentation used in industry. Emphasis is placed on electric, electronic, and other instruments. Upon completion, students should be able to install, maintain, and calibrate instrumentation.

ELN 131   Analog Electronics I   3-3-4
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.

ELN 132   Analog Electronic II   3-3-4
Local Prerequisite: ELN 131 or ELC 140
This course covers additional applications of analog electronic circuits with an emphasis on analog and mixed signal integrated circuits (IC). Topics include amplification, filtering, oscillation, voltage regulation, and other analog circuits. Upon completion, students should be able to construct, analyze, verify, and troubleshoot analog electronic circuits using appropriate techniques and test equipment.

ELN 133   Digital Electronics   3-3-4
Local Prerequisite: EGR 131 or ELC 131 or Instructor Approval
This course covers combinational and sequential logic circuits. Topics include number systems, Boolean algebra, logic families, medium scale integration (MSI) and large scale integration (LSI) circuits, analog to digital (AD) and digital to analog (DA) conversion, and other related topics. Upon completion, students should be able to construct, analyze, verify, and troubleshoot digital circuits using appropriate techniques and test equipment.

ELN 232   Introduction to Microprocessors   3-3-4
Local Prerequisite: ELN 133 or Instructor Approval
This course introduces microprocessor architecture and microcomputer systems including memory and input/output interfacing. Topics include low-level language programming, bus architecture, I/O systems, memory systems, interrupts, and other related topics. Upon completion, students should be able to interpret, analyze, verify, and troubleshoot fundamental microprocessor circuits and programs using appropriate techniques and test equipment.

ELN 236   Fiber Optics and Lasers   3-2-4
This course introduces the fundamentals of fiber optics and lasers. Topics include the transmission of light; characteristics of fiber optic and lasers and their systems; fiber optic production; types of lasers; and laser safety. Upon completion, students should be able to understand fiber optic communications and basic laser fundamentals.

ELN 247   Electronic Application Project   1-3-2
Local Prerequisite: ELN 133, ELN 132 or ELN 140
This course provides a structured approach to an application-oriented electronics project. Emphasis is placed on selecting, planning, implementing, testing, and presenting an application-oriented project. Upon completion, students should be able to present and demonstrate an electronics application-oriented project.

ELN 275   Troubleshooting   1-3-2
Local Prerequisites: ELN 133 and ELN 132
This course covers techniques of analyzing and repairing failures in electronic equipment. Topics include safety, signal tracing, use of service manuals, and specific troubleshooting methods for analog, digital, and other electronics-based circuits and systems. Upon completion, students should be able to logically diagnose and isolate faults and perform necessary repairs to meet manufacturers' specifications.

ENG 111   Writing and Inquiry   3-0-3
Prerequisites: DRE 098 or ENG 002
Local Prerequisites: Take one: 1) ENG 011; 2) ENG 002; 3) DRE 098; 4) ENG 090; 5) ENG 095
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.

ENG 112   Writing/Research in the Disciplines   3-0-3
Prerequisite: ENG 111
This course, the second in a series of two, introduces research techniques, documentation styles, and writing strategies. Emphasis is placed on analyzing information and ideas and incorporating research findings into documented writing and research projects. Upon completion, students should be able to evaluate and synthesize information from primary and secondary sources using documentation appropriate to various disciplines. This course has been approved for transfer under the CAA and

ICAA as a universal general education transfer component (UGETC) course in English Composition.

ENG 114   Professional Research and Reporting   3-0-3
Prerequisite: ENG 111
This course, the second in a series of two, is designed to teach professional communication skills. Emphasis is placed on research, listening, critical reading and thinking, analysis, interpretation, and design used in oral and written presentations. Upon completion, students should be able to work individually and collaboratively to produce well-designed business and professional written and oral presentations. This course has been approved for transfer under the CAA and ICAA as a general education course in English Composition.

ISC 221   Statistical Qual Control   3-0-3
Local Prerequisites: Completion of curriculum mathematics requirement
This course covers the principles and techniques of statistical process control for the improvement of productivity. Emphasis is placed on basic statistics for quality control, organization and procedures for efficient quality control including inspections, process control, and tests of significance. Upon completion, students should be able to apply statistical principles and techniques to enhance production.

LEO 111   Lasers and Applications   1-3-2
Corequisite: MAT 122
This course covers the basic principles of laser operations and applications with a particular emphasis on laser safety. Topics include the properties of laser light, laser components, laser beam characteristics, and laser safety. Upon completion, students should be able to make measurements of laser beam characteristics and conduct a safety audit and hazards analysis of a laser facility.

MAT 121   Algebra/Trigonometry I   2-2-3
Prerequisite: Take one set:
Set 1: DMA 010, DMA 020, DMA 030, DMA 040, DMA 050, and DMA 060; Set 2: DMA 025, DMA 040, DMA 050, DMA 060; Set 3: DMA 025, DMA 045, DMA 060; Set 4: DMA 010, DMA 020, DMA 030, DMA 045, DMA 060; Set 5: MAT 003;
Local RISE corequisites: Take one group:
1) MAT-021; 2) MAT-003; 3) DMA-010, DMA-020, DMA-030, DMA-040, DMA-050, DMA-060; 4) MAT-121; 5) MAT-161
7). DMA-010, DMA-020, DMA-030, DMA-040, DMA-050, DMA-065; 7. DMA-010, DMA-020, DMA-030, DMA-045, DMA-065; 8) DMA-025, DMA-045, DMA-060, DMA-070, DMA-080; 9) DMA-025, DMA-040, DMA-050, DMA-065; 10) MAT-060, MAT-070; 11) MAT-060, MAT-080; 12) MAT-060, MAT-090; 13. MAT-095
This course provides an integrated approach to technology and the skills required to manipulate, display, and interpret mathematical functions and formulas used in problem solving. Topics include the properties of plane and solid geometry, area and volume, and basic proportion applications; simplification, evaluation, and solving of algebraic equations and inequalities and radical functions; complex numbers; right triangle trigonometry; and systems of equations. Upon completion, students will be able to demonstrate the ability to use mathematics and technology for problem-solving, analyzing and communicating results.

MAT 122   Algebra/Trigonometry II   2-2-3
Prerequisite: MAT 121
This course is designed to cover concepts in algebra, function analysis, and trigonometry. Topics include exponential and logarithmic functions, transformations of functions, Law of Sines, Law of Cosines, vectors, and statistics. Upon completion, students should be able to demonstrate the ability to use mathematics and technology for problem-solving, analyzing and communicating results.

MAT 171   Precalculus Algebra   3-2-4
Prerequisite: Take one set:
1. DMA-010, DMA-020, DMA-030, DMA-040, DMA-050, DMA-060, DMA-070, and DMA-080; 2. DMA-010, DMA-020, DMA-030, DMA-040, DMA-050, and DMA-065; 3. DMA-010, DMA-020, DMA-030, DMA-045, DMA-060, DMA-070, and DMA-080
4. DMA-010, DMA-020, DMA-030, DMA_045, & DMA-065;
5. DMA-025, DMA-040, DMA-050, DMA-060, DMA-070, & DMA-080; 6. DMA-025, DMA-040, DMA-050, & DMA-065;
7. DMA-025, DMA-045, DMA-060, DMA-070, & DMA-080;
8. DMA-025, DMA-045, & DMA-065; 9. MAT-212; 10. MAT-003
Local RISE Corequisites: Take one group: 1. MAT-071; 2. MAT-003; 3. DMA-010, DMA-020, DMA-030, DMA-040, DMA-050, DMA-060, DMA-070, DMA-080; 4. MAT-121; 5. MAT-161;
6. DMA-010, DMA-020, DMA-030, DMA-040, DMA-050, DMA-065; 7. DMA-010, DMA-020, DMA-030, DMA-045, DMA-065; 8. DMA-025, DMA-045, DMA-065; 9. DMA-025, DMA-040, DMA-050, DMA-060, DMA-070, DMA-080; 10. DMA-025, DMA-045, DMA-060, DMA-070, DMA-080; 11. DMA-010, DMA-020, DMA-030, DMA-045, DMA-060, DMA-070, DMA-080; 12. DMA-025, DMA-040, DMA-050, DMA-065; 13. MAT-060, MAT-080; 14. MAT-060, MAT-090; 15. MAT-095
This course is designed to develop topics which are fundamental to the study of Calculus. Emphasis is placed on solving equations and inequalities, solving systems of equations and inequalities, and analysis of functions (absolute value, radical, polynomial, rational, exponential, and logarithmic) in multiple representations. Upon completion, students should be able to select and use appropriate models and techniques for finding solutions to algebra-related problems with and without technology. This course has been approved for transfer under the CAA and ICAA as a universal general education transfer component (UGETC) course in Mathematics.

MAT 172   Precalculus Trigonometry   3-2-4
Prerequisite: MAT 171
This course is designed to develop an understanding of topics which are fundamental to the study of Calculus. Emphasis is placed on the analysis of trigonometric functions in multiple representations, right and oblique triangles, vectors, polar coordinates, conic sections, and parametric equations. Upon completion, students should be able to select and use appropriate models and techniques for finding solutions to trigonometry-related problems with and without technology. This course has been approved for transfer under the CAA and ICAA as a universal general education transfer component (UGETC) course in Mathematics.

NOS 130   Windows Single User   2-2-3
This course introduces operating system concepts for single-user systems. Topics include hardware management, file and memory management, system configuration/ optimization, and utilities. Upon completion, students should be able to perform operating systems functions at the support level in a single-user environment.

PCI 170   DAQ and Control   3-3-4
This course is a survey of data acquisition and control applications in an industrial setting. Topics include remote I/O systems, PC-based data acquisition, real-time monitoring, and other related topics. Upon completion, students should be able to demonstrate an understanding of data acquisition circuits.

PHY 131   Physics-Mechanics   3-2-4
Prerequisite: MAT 121, or MAT 171
This algebra/trigonometry-based course introduces fundamental physical concepts as applied to engineering technology fields. Topics include systems of units, problem solving methods, graphical analysis, vectors, motion, forces, Newton's laws of motion, work, energy, power, momentum, and properties of matter. Upon completion, students should be able to apply the principles studied to applications in engineering technology fields.

PHY 133   Physics-Sound and Light   3-2-4
Prerequisite: PHY 131
This algebra/trigonometry-based course is a study of fundamental physical concepts as applied to engineering technology fields. Topics include systems of units, problem solving methods, graphical analysis, wave motion, sound, light, and modern physics. Upon completion, students should be able to apply the principles studied to applications in engineering technology fields.

PHY 151   College Physics I   3-2-4
Prerequisite: MAT 171 or MAT 271
This course uses algebra and trigonometry-based mathematical models to introduce the fundamental concepts that describe the physical world. Topics include units and measurement, vectors, linear kinematics and dynamics, energy, power, momentum, fluid mechanics, and heat. Upon completion, students should be able to demonstrate an understanding of the principles involved and display analytical problem solving ability for the topics covered. This course has been approved for transfer under the CAA and ICAA as a universal general education transfer component (UGETC) course in Natural Sciences.

PHY 152   College Physics II   3-2-4
Prerequisite: PHY 151
This course uses algebra/trigonometry-based mathematical models to introduce the fundamental concepts that describe the physical world. Topics include electrostatic forces, electric fields, electric potentials, direct-current circuits, magnetostatic forces, magnetic fields, electromagnetic induction, alternating-current circuits, and light. Upon completion, students should be able to demonstrate an understanding of the principles involved and display analytical problem solving ability for the topics covered. This course has been approved for transfer under the CAA and ICAA as a universal general education transfer component (UGETC) course in Natural Sciences.