CENTRAL CAROLINA COMMUNITY COLLEGE

Applied Technologies

Program Planning Guide

Automotive Systems Technology, Electrical Vehicle Track, Diploma (D60160EV)

Program Length: 3 semesters
Program Sites: Lee Main Campus - Day Program
Career Pathway Options: Associate in Applied Science Degree in Automotive Systems (Electrical Vehicle Track) Technology; Diploma in Automotive Systems (Electrical Vehicle) Technology Diploma

Suggested Course Schedule		Class	Lab	Work	Credits	Notes:
1st Semester (fall)						
EVX 115	Light Electric Vehicle Tech	1	2	0	2	
EVX 110	Intro to Electrified Transportation	1	2	0	2	
TRN 120	Basic Transp Electricity	4	3	0	5	
TRN 170	PC Skills for Transp	1	2	0	2	
Math Requirement					3/4	
	Total Semester Hours				**14/15**	
2nd Semester (spring)						
AUT 141	Suspension & Steering Sys	2	3	0	3	
AUT 141A	Suspension & Steering Lab	0	3	0	1	
EVX 120	Electric Vehicle Technology	2	3	0	3	
EVX 130	Hybrid Vehicle Technology	2	3	0	3	
English requirement		3	0	0	3	
	Total Semester Hours	**9**	**12**	**0**	**13**	
3rd Semester (summer)						
ATT 125	Hybrid-Electric Transportation	2	4	0	4	
AUT 114	Safety and Emissions	1	2	0	2	
AUT 114A	Safety and Emissions Lab	0	2	0	1	
TRN 140	Transp Climate Control	1	2	0	2	
TRN 140A	Transp Climate Cont Lab	1	2	0	2	
	Total Semester Hours	**5**	**12**	**0**	**11**	
Total Semester Credit Hours Required for Graduation: 36						

Effective Term: 2026Fall

Course Descriptions

ATT 115 Green Trans Safety & Service
This course covers workplace safety, hazardous material and environmental regulation relevant to electric, hybrid and alternative fueled vehicles. Topics include safety of high voltage vehicle systems, gaseous fuel systems and alternative liquid fuels. Upon completion, students should be able to demonstrate safe work practices, utilize appropriate shop tools and explain government regulations associated with alternative transportation.

ATT 125 Hybrid-Electric Transportation
Prerequisite: TRN 120
This course covers the theory and operation of hybrid-electric drive vehicles. Topics include maintenance, diagnostics, repair and safety procedures for electrically propelled and hybrid vehicles. Upon completion, students should be able to perform diagnostics, maintenance and repair hybrid-electric drive vehicles.

AUT 114 Safety and Emissions
This course covers the laws, procedures, and specifications needed to perform a North Carolina State Safety and Emissions inspection. Topics include brake, steering and suspension, lighting, horn, windshield wiper, tire, mirrors, and emission control devices inspection. Upon completion, students should be able to perform complete and thorough North Carolina State Safety and Emissions inspections.

AUT 114A Safety and Emissions Lab
Corequisite: Take AUT 114
This course is an optional lab that allows students to enhance their understanding of North Carolina State Emissions Inspection failures. Topics include evaporative, positive crankcase ventilation, exhaust gas recirculation and exhaust emissions systems operation, including catalytic converter failure diagnosis. Upon completion, students should be able to employ diagnostic strategies to repair vehicle emissions failures resulting from North Carolina State Emissions inspection.

AUT 141 Suspension & Steering Sys
This course covers principles of operation, types, and diagnosis/repair of suspension and steering systems to include steering geometry. Topics include manual and power steering systems and standard and electronically controlled suspension and steering systems. Upon completion, students should be able to service and repair steering and suspension components, check and adjust alignment angles, repair tires, and balance wheels.

AUT 141A Suspension & Steering Lab
Corequisite: Take AUT 141
This course is an optional lab to be used as an alternative to co-op placement in meeting the NATEF standards for total hours. Topics include manual and power steering systems and standard and electronically controlled suspension and steering systems. Upon completion, students should be able to service and repair steering and suspension components, check and adjust alignment angles, repair tires, and balance wheels.

EVX 110 Intro to Electrified Transp
This course covers the fundamentals of electrified transportation technologies, emphasizing workplace safety and environmental regulation to alternative fuels. Topics include the safety protocols for high-voltage vehicle systems, gaseous and liquid alternative fuels, and Plugin Hybrid and EV charging infrastructure. Upon completion, students should be able to demonstrate safe work practices, service modern hybrid and electric vehicles.

EVX-115 Light Electric Vehicle Tech
This course introduces the core technologies common to all Electric & Hybrid Vehicles (xEVs), covering basic electric motor, battery, and controller theory, including special test and charging equipment. Topics include DC and AC motor & motor controller technologies with hands-on Light EV BLDV motor & controller technologies, as well as Battery, Battery Management, and Battery Charging technologies. Upon completion, students should be able to understand how xEV motors, motor controllers, battery packs, and battery charging systems work and diagnose common malfunctions in all these xEV core technologies.

EVX 120 Electric Vehicle Technologies
Prerequisite: Take TRN 120
This course covers the essential systems and technologies of electric vehicles (EVs), focusing on safety and maintenance. Topics include a review of electrical principles, high-voltage safety protocols, and the design, testing, and maintenance of crucial EV components such as batteries, motors, inverters, and onboard chargers. Upon completion, students should be able to perform diagnostic evaluations and effectively maintain and troubleshoot battery electric vehicles.

EVX 130 Hybrid Vehicle Technologies
Prerequisite: Take TRN 120
This course covers the critical systems and technologies of hybrid vehicles, focusing on safety and maintenance. Topics include a review of electrical principles and safety protocols for hybrid and battery-electric vehicles (BEVs) and the design, testing, and maintenance of critical components such as batteries, motors, inverters, and transmissions. Upon completion, students should be able to perform diagnostic evaluations and effectively maintain and troubleshoot hybrid vehicles.

MAT 110 Math Measurement & Literacy
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.

PHY 110 Conceptual Physics
This course provides a conceptually-based exposure to the fundamental principles and processes of the physical world. Topics include basic concepts of motion, forces, energy, heat, electricity, magnetism, and the structure of matter and the universe. Upon completion, students should be able to describe examples and applications of the principles studied. This course has been approved for transfer under the CAA/ICAA as a general education course in Natural Science.

PHY 110A Conceptual Physics Lab
Corequisite: Take PHY 110
This course is a laboratory for PHY 110. Emphasis is placed on laboratory experiences that enhance materials presented in PHY 110. Upon completion, students should be able to apply the laboratory experiences to the concepts presented in PHY 110. This course has been approved for transfer under the CAA/ICAA as a general education course in Natural Science.

TRN 120 Basic Transp Electricity
This course covers basic electrical theory, wiring diagrams, test equipment, and diagnosis, repair and replacement of batteries, starters, and alternators. Topics include Ohm's Law, circuit construction, wiring diagrams, circuit testing, and basic troubleshooting. Upon completion, students should be able to properly use wiring diagrams, diagnose, test, and repair basic wiring, battery, starting, charging, and electrical concerns.

TRN 140 Transp Climate Control
This course covers the theory of refrigeration and heating, electrical/electronic/pneumatic controls, and diagnosis and repair of climate control systems. Topics include diagnosis and repair of climate control components and systems, recovery/recycling of refrigerants, and safety and environmental regulations. Upon completion, students should be able to diagnose and repair vehicle climate control systems.

TRN 140A Transp Climate Control Lab
This course provides experiences for enhancing student skills in the diagnosis and repair of transportation climate control systems. Emphasis is placed on reclaiming, recovery, recharging, leak detection, climate control components, diagnosis, air conditioning equipment, tools and safety. Upon completion, students should be able to describe the operation, diagnose, and safely service climate control systems using appropriate tools, equipment, and service information.