



**Automotive Systems Technology Credential:
Diploma in Automotive Systems Technology
D60160**

This curriculum prepares individuals for employment as automotive service technicians. It provides an introduction to automotive careers and enhances the student's awareness of having to meet the challenges of this fast and ever-changing field. Classroom and lab experiences integrate technical and academic course work. Emphasis is placed on theory, servicing and operation of brakes, electrical/electronic systems, engine performance, steering/suspension, automatic transmission/transaxles, engine repair, climate control, and manual drive trains.

Upon completion of this curriculum students should be prepared for ASE certification and be ready for full-time employment in dealerships and repair shops in the automotive service industry. Cooperative education opportunities may be available at some North Carolina Community Colleges.

Program Length: 3 semesters
Career Pathway Options: Associate in Applied Science Degree in Automotive Systems Technology (Higher entrance standards required); Diploma in Automotive Systems Technology
Program Sites: Lee Campus - Day Program

**Course Requirements for Automotive Systems Technology
Diploma**

A. General Education Courses (6/7 SHC)	C-L-SHC
*ENG 102 Applied Communication II	3-0-3
*MAT 101 Applied Mathematics I	2-2-3
Or	
PHY 121 Applied Physics I	3-2-4

B. Required Major Core Courses (18 SHC)	
AUT 141 Suspension and Steering Systems	2-3-3
AUT 151 Brake Systems	2-3-3
AUT 161 Basic Auto Electricity	4-3-5
AUT 181 Engine Performance I	2-3-3
AUT 183 Engine Performance II	2-6-4

C. Other Major Hours Required for Graduation (19/20 SHC)	
AUT 110 Intro to Auto Technology	2-2-3
AUT 114 Safety and Emissions	1-2-2
AUT 114A Safety and Emissions Lab	0-2-1
AUT 141A Suspension and Steering Lab	0-3-1
AUT 151A Brake Systems Lab	0-3-1
AUT 163 Advanced Auto Electricity	2-3-3
AUT 163A Advanced Auto Electricity Lab	0-3-1
AUT 171 Auto Climate Control	2-4-4
AUT 181A Engine Performance I Lab	0-3-1
AUT 186 PC Skills for Auto Techs	2-2-3
OR	
CIS 111 Basic PC Literacy	1-2-2

*These courses are not transferable to the Associate in Applied Science Degree.

Total Semester Hours Credit required for graduation: 43/45

**Semester Curriculum for Automotive Systems Technology
Diploma**

1st Semester (Fall)		C-L-SHC
AUT 110	Intro to Auto Technology	2-2-3
AUT 141	Suspension & Steering Sys	2-3-3
AUT 141A	Suspension & Steering Sys Lab	0-3-1
AUT 161	Basic Auto Electricity	4-3-5
AUT 186	PC Skills for Auto Techs	2-2-3
	OR	
CIS 111	Basic PC Literacy	1-2-2
*MAT 101	Applied Mathematics I	2-2-3
	Or	
PHY 121	Applied Physics I	<u>3-2-4</u>
		11/13-15-17/19

2nd Semester (Spring)		
AUT 151	Brake Systems	2-3-3
AUT 151A	Brake Systems Lab	0-3-1
AUT 163	Advanced Auto Electricity	2-3-3
AUT 163A	Advanced Auto Electricity Lab	0-3-1
AUT 181	Engine Performance I	2-3-3
AUT 181A	Engine Performance I Lab	0-3-1
*ENG 102	Applied Communication II	<u>3-0-3</u>
		9-18-15

3rd Semester (Summer)		
AUT 114	Safety and Emissions	1-2-2
AUT 114A	Safety and Emissions Lab	0-2-1
AUT 171	Auto Climate Control	2-4-4
AUT 183	Engine Performance-Fuels	<u>2-6-4</u>
		5-14-11

*These courses are not transferable to the Associate in Applied Science Degree.

Total Semester Hours Credit: 43/45

COURSE DESCRIPTIONS

AUT 110 Intro to Auto Technology 2-2-3
This course covers workplace safety, hazardous material and environmental regulations, use of hand tools, service information resources, basic concepts, systems, and terms of automotive technology. Topics include familiarization with vehicle systems along with identification and proper use of various automotive hand and power tools. Upon completion, students should be able to describe safety and environmental procedures, terms associated with automobiles, and identify and use basic tools and shop equipment.

AUT 114 Safety and Emissions 1-2-2
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 0-2-1

Corequisite: 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 emission 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 and Steering Systems 2-4-4

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 0-3-1

Corequisite: 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.

AUT 151 Brake Systems 2-2-3

This course covers principles of operation and types, diagnosis, service, and repair of brake systems. Topics include drum and disc brakes involving hydraulic, vacuum boost, hydra-boost, electrically powered boost, and anti-lock and parking brake systems. Upon completion, students should be able to diagnose, service, and repair various automotive braking systems.

AUT 151A Brake Systems Lab 0-3-1

Corequisites: AUT 151

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 drum and disc brakes involving hydraulic, vacuum-boost, hydra-boost, electrically powered boost, and anti-lock, parking brake systems and emerging brake system technologies. Upon completion, students should be able to diagnose, service, and repair various automotive braking systems.

AUT 161 Basic Auto Electricity 4-3-5

This course covers basic electrical theory and wiring diagrams, test equipment, and diagnosis/repair/replacement of batteries, starters, alternators, and basic electrical accessories. Topics include diagnosis and repair of battery, starting, charging, lighting, and basic accessory systems problems. Upon completion, students should be able to diagnose, test, and repair the basic electrical components of an automobile.

AUT 163 Adv Auto Electricity 2-3-3

Corequisites: AUT 161

This course covers electronic theory, wiring diagrams, test equipment, and diagnosis, repair, and replacement of electronics, lighting, gauges, horn, wiper, accessories, and body modules. Topics include networking and module communication, circuit construction, wiring diagrams, circuit testing, and troubleshooting. Upon

completion, students should be able to properly use wiring diagrams, diagnose, test, and repair wiring, lighting, gauges, accessories, modules, and electronic concerns.

AUT 163A Adv Auto Electricity Lab 0-3-1

Corequisite: AUT 163

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 networking and module communication, circuit construction, wiring diagrams, circuit testing, troubleshooting and emerging electrical/electronic systems technologies. Upon completion, students should be able to properly use wiring diagrams, diagnose, test, and repair wiring, lighting, gauges, accessories, modules, and electronic concerns.

AUT 171 Auto Climate Control 2-4-4

This course covers the theory of refrigeration and heating, electrical/electronic/pneumatic controls, and diagnosis/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 describe the operation, diagnose, and safely service climate control systems using appropriate tools, equipment, and service information.

AUT 181 Engine Performance I 2-3-3

This course covers the introduction, theory of operation, and basic diagnostic procedures required to restore engine performance to vehicles equipped with complex engine control systems. Topics include an overview of engine operation, ignition components and systems, fuel delivery, injection components and systems, and emission control devices. Upon completion, students should be able to describe operation and diagnose/repair basic ignition, fuel, and emission-related drivability problems using appropriate test equipment/service information.

AUT 181A Engine Performance I Lab 0-3-1

Corequisite: AUT 181

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 overviews of engine operation, ignition components and systems, fuel delivery, injection components and systems, and emission control devices and emerging engine performance technologies. Upon completion, students should be able to describe operation and diagnose/repair basic ignition, fuel and emission related drivability problems using appropriate test equipment/service information.

AUT 183 Engine Performance II 2-6-4

Prerequisite: AUT 181

This course covers the study of the electric engine control systems, the diagnostic process used to locate engine performance concerns and procedures used to restore normal operation. Topics will include currently used fuels and fuel systems, exhaust gas analysis, emission control components and systems, OBD II (on-board diagnostics) and inter-related electrical/electronic systems. Upon completion, students should be able to diagnose and repair complex engine performance concerns using appropriate test equipment and service information.

AUT 186 PC skills for Auto Techs 2-2-3

This course introduces students to personal computer literacy and Internet literacy with an emphasis on the automotive service industry. Topics include service information systems, management systems, computer-based systems, and PC based diagnostic equipment. Upon

completion, students should be able to access information pertaining to automotive technology and perform word processing.

CIS 111 Basic PC Literacy 1-2-2

This course provides an overview of computer concepts. Emphasis is placed on the use of personal computers and software applications for personal and fundamental workplace use. Upon completion, students should be able to demonstrate basic personal computer skills.

ENG 102 Applied Communications II 3-0-3

Prerequisites: RED 080 and ENG 090 or appropriate placement test scores

This course is designed to enhance writing and speaking skills for the workplace. Emphasis is placed on generating short writings such as job application documents, memoranda, and reports and developing interpersonal communication skills with employees and the public. Upon completion, students should be able to prepare effective, short, and job-related written and oral communications. The computer is used as a writing and design tool for this course. This is a diploma-level course.

MAT 101 Applied Mathematics I 2-2-3

Prerequisites: MAT 060, MAT 070, or MAT 080 or appropriate placement test scores

This course is a comprehensive review of arithmetic with basic algebra designed to meet the needs of certificate and diploma programs. Topics include arithmetic and geometric skills used in measurement, ratio and proportion, exponents and roots, applications of percent, linear equations, formulas, and statistics. Upon completion, students should be able to solve practical problems in their specific areas of study. This course is intended for certificate and diploma programs.

PHY 121 Applied Physics I 3-2-4

Prerequisites: MAT 060

This algebra-based course introduces fundamental physical concepts as applied to industrial and service technology fields. Topics include systems of units, problem-solving methods, graphical analyses, vectors, motion, forces, Newton's laws of motion, work, energy, power, momentum, and properties of matter. Upon completion, students should be able to demonstrate an understanding of the principles studied as applied in industrial and service fields