

# AUTO TECHNOLOGY (AUT)

## Courses

### AUT 111 Engine Overhaul (3)

Engine overhaul introduces the student to the concepts and skills necessary to diagnose and overhaul automotive engines. Areas covered in this class include introduction to specialty tools and their correct use, complete engine disassembly, inspection and measurement of internal components including heads, valve resurfacing, and proper fitting and reassembly of entire "long block". Class time is divided between classroom and lab.

### AUT 130 Manual Transmission I (2)

Manual Drive Train & Axles I is a basic introduction to the manual transmission found in the automotive industry. The course includes an introduction to the theory behind manual transmissions, identification of the different types of transmission and their components, and an introduction to the specialized tools used in servicing transmissions, synchromesh transmissions, gear ratios found in different transmissions, an introduction to manual clutches and transfer cases, and drive shaft technology including CV joint and bearing replacement. Students will receive instruction that will assist them in taking the Automotive Service Excellence (ASE) exams after successfully completing the 1st and 2nd levels of the automotive technology program.

### AUT 140 Suspension and Steering I (3)

Suspension & Steering I introduces automotive steering and suspension systems. The course includes hydraulic principles, bushing replacement, long and short arm diagnosis and replacement, parallelogram steering geometry diagnosis and repair, McPherson strut strip down and refit, and the effect of damping and rebound on the vehicle handling, spring design measuring, and replacement. Classroom time is divided between lecture, discussion, and individual learning activities.

### AUT 145 Suspension and Steering II (3)

Steering & Suspension II is the advanced application of knowledge and hands-on skills learned in AUT140 (Steering & Suspension I). The course includes the use of alignment geometry and computerized alignment equipment to diagnose and repair steering suspension problems and to verify that a vehicle's suspension and steering components are within manufacturer's specifications. It also includes removing and replacing steering and suspension components according to manufacturer's specifications, inspecting, servicing, and repairing wheel and tire assemblies for optimum performance. Prerequisite: AUT140

### AUT 150 Brakes I (3)

Brakes I is a basic introduction to automotive brake technology. The emphasis in this course is on diagnosing and maintaining brake systems. It covers identification of brake parts and how they function, the use and types of friction materials and heat dissipation, stripping and refitting disc and drum brakes, rotor diagnosing including measurement and cutting, identification of pad types, hydraulic principles and brake bleeding. The course is closely aligned with NATEF/ASE task list for A5 and will prepare the student to take the Automotive Service Excellence (ASE) exams. Classroom time is divided between lecture, discussion, and individual learning activities.

### AUT 155 Brakes II (4)

Brakes II apply the knowledge and hands-on skills acquired in AUT150 (Brakes I). It includes testing troubleshooting, diagnosing, disassembling, and replacing both automotive drum and disc brake systems using manufacturer's specifications, four-wheel and rear wheel anti-lock braking system components, operations, and repairs will also be covered. Prerequisite: AUT150

### AUT 161 Electrical I (3)

In this course students will complete service work orders; describe the relationship between voltage, ohms and amperage; perform basic electrical circuit repairs; identify electrical system faults; identify basic wiring diagram symbols, components, and legend information; perform basic electrical circuit measurements using a DVOM; describe basic circuit characteristics of series, parallel and series parallel circuits through a variety of classroom and shop learning assessment activities.

### AUT 162 Electricity/Electronics I (2)

Electrical & Electronic Systems I builds on the skills developed in Electrical I. This course emphasizes battery design, starter systems, and the charging system and its components. In addition to these systems, hybrid technology will be explored. Class time is divided between the classroom and lab experiences. Classroom is primarily lecture, discussion, and group or individual learning activities that emphasize troubleshooting and problem-solving skill development.

### AUT 165 Engine Mechanical Diagnosis (2)

Engine Mechanical Diagnosis involves diagnostic theory, process, and testing as well as practicing major component replacement. Students will split their time between the classroom and lab.

### AUT 170 Heating - Air Conditioning I (2)

Heating & Air Conditioning I is an introductory course that is designed to provide the student with a solid foundation in automotive heating and air conditioning. Class time is divided between the classroom and lab experiences. Classroom time is spent primarily on lecture, discussion, and group or individual learning activities that provide a foundation to encourage troubleshooting skill development.

### AUT 181 Engine Performance I (3)

In this learning plan students will complete work order and check history; identify engine mechanical integrity; explore the fundamentals of fuel system theory; identify fuel system concerns; explore the fundamentals of ignition theory; identify ignition system concerns; identify induction system concerns; identify exhaust system concerns; identify engine mechanical integrity through a variety of learning and assessment activities.

### AUT 182 Engine Performance II (3)

Engine Performance II builds on the knowledge and skills developed in Engine Performance I. The course continues the study of theory and of power train diagnostics. Students will learn the rudiment of computerized engine controls, ignition systems, fuel, air induction, and exhaust and emission control systems. The course provides extensive hands-on training on the use of the latest diagnostic equipment and tools.

**AUT 205 Auto Transmission/Transaxle I (2)**

Automatic Transmission/Transaxle I is a basic introduction to automatic transmissions/transaxle systems. The course includes an introduction to hydraulic principles, an introduction to the different types of automatic transmission fluids, automotive measurement, and the identification to the parts of the automatic transmission including planetary gear sets, brake bands, bearings, pumps, boost systems, and valve bodies. It also contains some basic services performed on an automatic transmission including oil filter replacement, air testing of clutch packs, removing and refitting a transaxle and/or transmission. Students will receive instruction that will assist them in taking the Automotive Service Excellence (ASE) Exams after successfully completing the requirements of the 1st and 2nd levels of the automotive technology program.

**AUT 215 Auto Transmission/Transaxle II (2)**

Automatic Transmission & Transaxles II is the advanced application of knowledge and hands-on skills acquired in Automatic Trans & Transaxles I. The course includes testing, troubleshooting and diagnosing, disassembly, inspection, and assembly of automatic transmissions and transaxles according to manufacturer's specifications. Electronically controlled automatic transmission components and operation are covered along with diagnosing and repair. Students will receive instruction that will assist them in taking the Automotive Service Excellence (ASE) exams after successfully completing the requirements of the 1st and 2nd levels of the automotive technology program.

**AUT 230 Manual Transmission II (2)**

Manual Drive Train and Axles II contains the advanced application of knowledge and hands on skills acquired in Manual Drive Train & Axles I. Emphasis will be on testing, troubleshooting and diagnosing, disassembling, inspecting and assembling transmissions and trans axles according to manufacturer's specifications. Students will receive instruction that will assist them in taking the automotive excellence (ASE) exams after successfully completing the requirements of the 1st and 2nd levels of the automotive technology program.

**AUT 260 Electricity/Electronics II (6)**

Electricity/Electronic Systems II is an advanced level course and builds on the knowledge, skills and abilities mastered in Electricity/Electronic Systems I. This class involves the theory and application of automotive electronic circuits and accessories. It includes the construction and servicing of lighting systems, gauges, warning devices, windshield wipers, and solid state devices. The course provides the knowledge to prepare for the Automotive Service Excellence (ASE) Exams. The course is aligned closely with the NATEF/ASE task list for A6 Electrical/Electronic Systems.

**AUT 270 Heating - Air Conditioning II (2)**

Heating and Air Conditioning II is an advanced level course and builds on the knowledge, skills and abilities mastered in AUT170 Heating & Air Conditioning I. Climate control systems are explained in-depth including theory of refrigeration, servicing procedures, and diagnosis techniques. Compressor service and distribution systems are studied. Laboratory experience is given in testing and servicing a variety of systems and problems. The course provides the knowledge to prepare for the Automotive Service Excellence (ASE) exams. The course is aligned closely with the NATEF/ASE task list for A7 Heating & Air Conditioning.

**AUT 281 Engine Performance III (5)**

Engine Performance III is an advanced level course and builds on the knowledge, skills, and abilities mastered in Engine Performance I (AUT181) and Engine Performance II (AUT182). This class involves theory and application of automotive engine diagnostics including computerized engine controls, ignition systems, fuel, air induction and exhaust systems, emission control systems, and exhaust gas treatments. The course provides extensive hands-on training on the use of the latest diagnostic equipment and tools. The class provides the knowledge to prepare for the Automotive Service Excellence (ASE) exams. The course is closely aligned with the NATEF/ASE task list for A8 Engine Performance.