

# Automotive Technology (AUTO)

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## Courses

### **AUTO 114 Introduction to Automotive Practices (4 Hours)**

This course is an introductory course required for all students in the Automotive Technology program. Upon successful completion of this course, the student should be able to develop shop safety habits, tool usage, information management and become proficient in general vehicle service and minor electrical diagnosis, while maintaining good work habits and ethics. Emphasis will be placed on learning basic skills needed to enter advanced automotive classes.

### **AUTO 121 Small Engine Service (3 Hours)**

Upon successful completion of this course, the student should be able to compare and contrast operating principles of two-stroke and four-stroke cycle engines. The student should be able to describe lubricating, cooling, fuel and governor systems; troubleshoot engine problems; inspect engine components; and service the fuel, cooling and exhaust systems. The student will be required to provide ANSI Z87 safety glasses and may be expected to provide other basic hand tools and/or equipment. 2 hrs. lecture, 3 hrs. lab/wk.

### **AUTO 129 Brakes I\* (3 Hours)**

**Corequisites:** AUTO 131.

**Prerequisites or corequisites:** AUTO 114 or AUTO 125.

Students will perform system pressure and travel calculations utilizing Pascal's Law, complete service work orders, determine appropriate system pressure tests utilizing service specifications, determine brake system concerns and necessary actions, diagnose poor stopping, pulling or dragging concerns caused by malfunctions in the hydraulic system, determine how to inspect, fabricate and/or replace brake lines and hoses, determine the service specifications pertaining to the removal, cleaning and refinishing procedures on brake drums, apply drum brake repair and replacement procedures, diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pedal pulsation concerns on disc-brake vehicles, determine disc brake repair and replacement procedures, determine how to accomplish caliper piston retractions, diagnose wheel bearing noise, wheel shimmy and vibration concerns, and determine how to remove, inspect and replace bearing and hub assemblies through a variety of classroom and lab/shop learning and assessment activities.

### **AUTO 131 Brakes II\* (1 Hour)**

**Corequisites:** AUTO 129.

**Prerequisites or corequisites:** AUTO 114 or AUTO 125.

Students will determine necessary brake system correction, conduct system pressure tests utilizing service specifications, perform diagnosis and correction for poor stopping, pulling or dragging concerns caused by malfunctions in the hydraulic system, conduct inspection, fabrication and/or replacement of brake lines and hoses, diagnose poor stopping noise vibration, pulling, grabbing, dragging or pedal pulsation concerns, perform service specifications pertaining to the removal, cleaning and refinishing procedures on brake drums, perform drum brake repair and replacement procedures, diagnose poor stopping noise vibration, pulling, grabbing, dragging or pedal pulsation concerns, perform disc brake repair and replacement procedures, machine rotor according to service specifications, perform caliper piston retraction where applicable, inspect and test power assist systems, determine necessary action on wheel bearing noise, wheel shimmy and vibration concern diagnoses, and perform the removal, inspection and replacement of bearing and hub assemblies.

### **AUTO 150 Steering and Suspension I\* (3 Hours)**

**Corequisites:** AUTO 151.

**Prerequisites or corequisites:** AUTO 114 or AUTO 125.

In this course students will document fundamental suspension systems concerns, perform fundamental diagnostics of steering systems, perform fundamental repairs of suspension systems, determine the need for wheel alignment, perform a four wheel alignment, and perform fundamental diagnostics and repair of wheel and tire systems.

### **AUTO 151 Alignment Practicum\* (1 Hour)**

**Corequisites:** AUTO 150.

**Prerequisites or corequisites:** AUTO 114 or AUTO 125.

This course will enhance the skills of diagnosing the need for wheel alignment and performing alignment of the steering and suspension systems.

### **AUTO 155 Automotive Engine Repair\* (3 Hours)**

**Prerequisites or corequisites:** AUTO 114 or AUTO 125 or department approval.

This course is designed to teach an understanding of the four-stroke cycle internal combustion engine. Students should be able to diagnose and repair cylinder heads and cylinder block assemblies to include lubrication and cooling systems. The student will be required to provide ANSI Z87 safety glasses.

### **AUTO 156 Electrical I\* (3 Hours)**

**Prerequisites or corequisites:** AUTO 114 or AUTO 125.

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 and assessment activities.

**AUTO 161 Engine Performance I\* (3 Hours)**

**Prerequisites :** AUTO 156.

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.

**AUTO 162 Electrical II\* (3 Hours)**

**Prerequisites :** AUTO 156.

This course is designed to teach starting system diagnosis and repair, charging system diagnosis and repair, and lighting systems diagnosis and repair.

**AUTO 201 ASE Certification Review\* (1 Hour)**

**Prerequisites or corequisites:** (AUTO 208 or AUTO 214) and (AUTO 207 or AUTO 209) and (AUTO 211 or AUTO 221) and (AUTO 250 or AUTO 252).

This course will prepare students to take any of the eight (8) basic National Institute for Automotive Service Excellence (ASE) automotive student certification tests.

**AUTO 205 Engine Performance II\* (3 Hours)**

**Prerequisites :** AUTO 161.

Upon successful completion of this course, the student should be able to describe the operation of engine management systems to include: general engine diagnosis, computerized engine controls diagnosis and repair, fuel, air induction, and exhaust diagnosis and repair, and emissions control systems diagnosis and repair. The student will be required to provide ANSI Z87 safety glasses and will be expected to provide other basic hand tools and/or equipment.

**AUTO 207 Manual Drivetrains and Axles\* (3 Hours)**

**Prerequisites :** (AUTO 114 or AUTO 125) and AUTO 156.

This course covers the theory of operation and service procedures for drivelines, constant velocity joints, manual transmissions and transaxles, differentials, clutches, and driveline phasing including noise, harness, and vibration analysis, and four wheel drive/all wheel drive systems.

**AUTO 211 Automotive Heating and Air Conditioning\* (3 Hours)**

**Prerequisites :** AUTO 156.

This course is designed to teach the operation, service, diagnoses and repair of automotive heating, ventilation and air conditioning systems. The theory and operation of these systems, major components, testing, recycling and other service procedures will be covered.

**AUTO 214 Electrical III\* (4 Hours)**

**Prerequisites :** AUTO 162 or AUTO 166.

This course is designed to teach advanced electrical/electronic systems. Students will perform general electrical system diagnosis; gauges, warning devices, and driver information systems diagnosis and repair; and body electrical systems diagnosis and repair.

**AUTO 215 Engine Performance III\* (3 Hours)**

**Prerequisites :** AUTO 205.

Upon successful completion of this course, the student should be able to service and repair fuels systems, ignition systems, and exhaust systems. The student will be required to provide ANSI Z87 safety glasses and will be expected to provide other basic hand tools and/or equipment.

**AUTO 237 Diesel and Hybrid Vehicles Maintenance and Light Repair\* (3 Hours)**

**Prerequisites :** AUTO 131 and (AUTO 162 or AUTO 166) or department approval.

This course is designed to teach an understanding of hybrid electric, diesel powerplants and related vehicle systems as it pertains to light maintenance and repair.

**AUTO 252 Automatic Transmissions\* (3 Hours)**

**Prerequisites :** AUTO 162 or AUTO 166.

This course is designed to teach diagnoses, service and repair of various automatic transmissions and automatic transaxles, both on vehicle and off vehicle, including computer-controlled systems.

**AUTO 265 Comprehensive Vehicle Diagnosis\* (3 Hours)**

**Prerequisites :** AUTO 161 and (AUTO 162 or AUTO 166).

This course is designed as a comprehensive technical course for learners in the Automotive Technology major. The course is primarily a lab-based course, with most of the course work consisting of diagnosing and repairing various problems on cars that the student may not have encountered in previous classes. Labs will test the learner on their ability to diagnose failures on a complete vehicle scale that include all electrical and mechanical systems and how they function relative to each other. As a portion of the course, reviewed material will follow the eight ASE 2017 standard areas of study, and will expand upon these areas via diagnostic and industry standard technical material and testing methods. Usage of the proper diagnostic processes is required for success in this course. Proper use of lab scopes, DVOM's, scan tools, and other high level diagnostic equipment are crucial to success in the course.

**AUTO 271 Automotive Technology Internship\* (3 Hours)**

**Prerequisites :** (AUTO 162 or AUTO 166) or Department approval.

Upon successful completion of this course, the student should be able to apply classroom knowledge to an actual work situation. The internship will provide advanced students on-the-job experience under the supervision of professionals in the industry. The work will be developed cooperatively with area employers, college staff and each student to provide a variety of actual job experiences directly related to the student's career goals.

**AUTO 291 Independent Study\* (1-7 Hour)**

**Prerequisites :** 2.0 GPA minimum and department approval.

Independent study is a directed, structured learning experience offered as an extension of the regular curriculum. It is intended to allow individual students to broaden their comprehension of the principles of and competencies associated with the discipline or program. Its purpose is to supplement existing courses with individualized, in-depth learning experiences. Such learning experiences may be undertaken independent of the traditional classroom setting, but will be appropriately directed and supervised by regular instructional staff. Total contact hours vary based on the learning experience.