

# Automotive Technology (AUTO)

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## Courses

### **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 125 Introduction to Automotive Shop Practices (3 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 and become proficient in tire, battery, cooling system, lubrication service and minor electrical diagnosis. Emphasis will be placed on learning basic skills needed to enter advanced automotive classes. 2 hrs. lecture, 3 hrs. lab/wk.

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

**Prerequisites or corequisites:** AUTO 125 Corequisite: AUTO 131.

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. 2 hrs. lecture 3 hrs. instructional lab/wk.

### **AUTO 130 Diesel Fundamentals\* (2 Hours)**

**Prerequisites or corequisites:** AUTO 125.

Upon successful completion of this course, the student should be able to identify diesel engine components and parts, troubleshoot and service all external components with an emphasis on glow plugs, injectors and injector pumps. The student will be required to provide ANSI Z87 safety glasses and may be expected to provide other basic hand tools and/or equipment. 1 hr. lecture, 3 hrs. lab/wk. This course is taught in the spring semester.

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

**Prerequisites or corequisites:** AUTO 125 Corequisite: AUTO 129.

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. 3 hrs. instruction lab/wk.

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

**Corequisites:** AUTO 151.

**Prerequisites or corequisites:** 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. 2 hrs. lecture/wk, 3 hrs. lab/wk.

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

**Corequisites:** AUTO 150.

**Prerequisites or corequisites:** AUTO 125.

This course will enhance the skills of diagnosing the need for wheel alignment and performing alignment of the steering and suspension systems. 3 hrs. lab/wk.

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

**Prerequisites or corequisites:** 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. 2 hrs. lecture, 3 hrs. instructional lab/wk.

**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. 2 hrs. lecture, 3 hrs. instructional lab/wk.

**AUTO 165 Automotive Engine Repair\* (4 Hours)**

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

Upon successful completion of this course, the student should be able to demonstrate 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 and may be expected to provide other basic hand tools and/or equipment. 2 hrs. lecture, 6 hrs. lab/wk.

**AUTO 166 Electrical II\* (2 Hours)**

**Prerequisites:** AUTO 156.

Upon completion of this course, the student should be able to perform battery diagnosis, perform battery service, perform starting system diagnosis, perform starting system repair, perform charging system diagnosis, perform charging system repair, and identify current flow on starting and charging system diagrams. 1 hr. lecture, 3 hrs. instructional lab/wk.

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

**Prerequisites or corequisites:** AUTO 208 and AUTO 209 and AUTO 221 and AUTO 250.

This course will prepare students to take any of the eight (8) basic National Institute for Automotive Service Excellence (ASE) automotive student certification tests. 1 hr. lecture/wk.

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

**Prerequisites:** AUTO 161 and AUTO 165.

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. 2 hrs. lecture, 3 hrs. instructional lab/wk.

**AUTO 208 Electrical III\* (3 Hours)**

**Prerequisites:** AUTO 165 and AUTO 166.

Upon successful completion of this course, the student should be able to diagnose general electrical system problems, diagnose and repair lighting systems, gauges, warning devices, horns, wiper and washer systems, and accessories. The student will be required to provide ANSI Z87 safety glasses and will be expected to provide other basic hand tools and/or equipment. 1 hr. lecture, 6 hrs. instructional lab/wk.

**AUTO 209 Manual Drive Train and Axles\* (4 Hours)**

**Prerequisites:** AUTO 156.

Upon successful completion of this course, the student should be able to work safely in the shop; perform manual transmission/transaxle diagnosis and repair; clutch diagnosis and repair; drive shaft, half-shaft, universal and constant velocity joint diagnosis and repair; and four wheel drive/all wheel drive diagnosis and repair. The student will be required to provide ANSI Z87 safety glasses and may be expected to provide other basic hand tools and/or equipment. 3 hrs. lecture, 3 hrs. instructional lab.

**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. 1 hr. lecture, 6 hrs. instructional lab.

**AUTO 221 Heating and Air Conditioning\* (4 Hours)**

**Prerequisites:** AUTO 156 and AUTO 165.

Upon successful completion of this course, the student should be able to operate, service and diagnose automotive heating, ventilation and air conditioning systems. The course will cover the theory and operation of these systems, major components, testing, recycling and other service procedures. The student will be required to provide ANSI Z87 safety glasses and may be expected to provide other basic hand tools and/or equipment. 3 hrs. lecture, 3 hrs. instructional lab.

**AUTO 235 Hybrid Alternative Fuels Vehicles Repair Maintenance\* (3 Hours)**

**Prerequisites or corequisites:** AUTO 131 and AUTO 205 and AUTO 208 and AUTO 221 and AUTO 250 or Department Approval.

This course will cover the technology of hybrid electric, electric, alternative fuel and fuel cell vehicles. Topics covered will include changes in the vehicle engine, drive train, emissions, heating/ventilation/air conditioning (HVAC), brake and computer systems. Variations between manufacturers will be covered. Students will learn to safely diagnose, repair and service these vehicles. 2 hrs. lecture/3 hrs. instructional lab/wk.

**AUTO 250 Automatic Transmissions and Transaxles\* (4 Hours)**

**Prerequisites:** AUTO 166 and AUTO 205.

Upon completion of this course, the student should be able to diagnose, service and repair various automatic transmissions and automatic transaxles, both on vehicle and off vehicle, including computer-controlled 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, 6 hrs. instructional lab.

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

**Prerequisites:** Department approval required.

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. 1 hr. lecture, 15 hrs. work min./wk.

**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.