

# AUTOMOTIVE TECHNOLOGY (AUTO)

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## **AUTO-1050 Numerical Applications in Automotive Service** **3 Credits**

Use of numerical concepts and principles in interpreting, assessing, and determining the need for automotive repair. Whole numbers, decimals, fractions, integers, graphs, ratios and percentages used to evaluate engine, electrical, chassis and HVAC system operation. Customary and metric conversions, reading automotive measuring devices and auto service repair order computations reviewed.

*Lecture: 3 hours*

*Prerequisite(s): None.*

## **AUTO-1101 Introduction to Automotive Service Procedures** **3 Credits**

Designed to provide introduction to several basic service procedures required of the person beginning work in automobile service center. Oil change, transmission service, tire service, fasteners cooling system service, safety inspection, battery testing will be some of the tasks demonstrated and/or practiced after introduction to shop safety and safe operation of automobile equipment and hand tools.

*Lecture: 2 hours. Laboratory: 2 hours*

*Prerequisite(s): None. CTAN Approved: Career Technical Assurance Guide CTAUT005 and Industry-Recognized Transfer Assurance Guide ITAUT005.*

## **AUTO-1300 Automotive Engines** **3 Credits**

Operation of internal combustion gasoline engine including engine fundamentals and removal, lubrication and cooling system operation, and cylinder head and engine block diagnosis. Engine disassembly, measurements for correctness, proper assembly techniques, and gasket and sealing information included.

*Lecture: 1 hour. Laboratory: 6 hours*

*Prerequisite(s): None.*

## **AUTO-1400 Automotive Alignment, Steering and Suspension** **3 Credits**

Theory and principles of automotive alignment geometry and automotive steering and suspension systems. Laboratory competencies integrate diagnosis and repair of these systems through use of special tools and alignment equipment.

*Lecture: 2 hours. Laboratory: 3 hours*

*Prerequisite(s): None.*

## **AUTO-1450 Automotive Braking Systems** **3 Credits**

Designed to provide student with foundation in theory and operation of automotive braking systems. Includes hydraulic brake principles, machining operations, and troubleshooting and repair of disc and drum brake assemblies. Operation and diagnosis of anti-lock braking systems included.

*Lecture: 2 hours. Laboratory: 3 hours*

*Prerequisite(s): None.*

## **AUTO-1502 Automotive Electrical Fundamentals** **3 Credits**

Fundamentals of electricity for automotive technicians. Electrical theory applied through construction of series, parallel and series-parallel circuits. Digital Volt Ohm Meter (DVOM) use in electrical diagnosing and testing of circuits covered, along with wire repair techniques. Emphasis on interpreting and using automotive electrical wiring schematics.

Batteries, horn, wiper and lighting systems examined.

*Lecture: 2 hours. Laboratory: 3 hours*

*Prerequisite(s): None.*

## **AUTO-1510 Automotive Electrical Systems** **3 Credits**

Integrates operational principles and diagnostic skills needed to repair various vehicle electrical systems utilizing electrical concepts and schematics. Charging and starting systems, including security systems, supplemental restraint (SRS), instrumentation, and body computers and related accessories are explained and analyzed. Laboratory practice provides student applied knowledge for troubleshooting these systems.

*Lecture: 2 hours. Laboratory: 3 hours*

*Prerequisite(s): AUTO-1502 Automotive Electrical Fundamentals; or departmental approval.*

## **AUTO-1820 Independent Study in Automotive Technology** **1-3 Credits**

Directed individual study. Study/research title and specific content arranged between instructor and student. May be repeated for a maximum of six credits of different topics.

*Lecture: 1-3 hours*

*Prerequisite(s): ENG-0995 Applied College Literacies, or appropriate score on English Placement Test. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.*

## **AUTO-1940 Automotive Field Experience I** **1 Credit**

Provides student with automotive field experience needed to develop career skills through work experience in automotive service industry.

*Other Required Hours: Field experience: 180 clock hours per semester.*

*Prerequisite(s): Departmental approval: job site approval.*

## **AUTO-1950 Automotive Field Experience II** **1 Credit**

Provides student with automotive field experience needed to develop career skills through work experience in automotive service industry.

*Other Required Hours: Field experience: Field experience: 180 clock hours per semester.*

*Prerequisite(s): Departmental approval: job site approval.*

## **AUTO-1960 Automotive Field Experience III** **1 Credit**

Provides student with automotive field experience needed to develop career skills through work experience in automotive service industry.

*Other Required Hours: Field experience: 180 clock hours per semester.*

*Prerequisite(s): Departmental approval: job site approval.*

### **AUTO-2300 Automatic Transmissions**

#### **3 Credits**

Operation of automotive transmissions and transaxles. Emphasis on knowledge and skills needed to properly diagnose transmission faults related to hydraulic, mechanical, and electrical systems that effect transmission operation. Specifics covered in this course include transmission operation, diagnostic, and service procedures, hydraulic fundamentals, controls and planetary gear train theory. Maintenance, diagnosis, inspection, overhaul proper assembly techniques of transmissions are included.

*Lecture: 1 hour. Laboratory: 6 hours*

*Prerequisite(s): AUTO-1502 Automotive Electrical Fundamentals.*

### **AUTO-2310 Manual Transmission and Drivetrain**

#### **3 Credits**

This course covers the operation, diagnosis, and repair of manual transmissions/transaxles, clutches, driveshafts, axles, and final drives. Topics include theory of torque, power flow, and manual drive train servicing and repair using appropriate service information, tools, and equipment. Upon completion, students should be able to explain operational theory, diagnose and repair manual drive trains. Laboratory skills emphasize diagnosis, troubleshooting, and repair.

*Lecture: 2 hours. Laboratory: 3 hours*

*Prerequisite(s): AUTO-1300 Automotive Engines; or departmental approval.*

### **AUTO-2350 Automotive HVAC**

#### **2 Credits**

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.

*Lecture: 1 hour. Laboratory: 3 hours*

*Prerequisite(s): AUTO-1502 Automotive Electrical Fundamentals; or departmental approval: industry-related experience.*

### **AUTO-2400 Engine Performance**

#### **3 Credits**

Fundamentals of proper engine performance. Ignition, electrical, engine mechanical, and fuel and emission system principles of operation, related driveability symptoms, and proper testing to verify cause will be explored. Digital Volt Ohm Meter (DVOM), scan tool and special tools used throughout course. Emphasis on operational concepts and individual component testing.

*Lecture: 1 hour. Laboratory: 6 hours*

*Prerequisite(s): AUTO-1300 Automotive Engines and AUTO-1502 Automotive Electrical Fundamentals; or departmental approval: industry-related experience.*

### **AUTO-2450 Automotive Electronic Engine Controls**

#### **3 Credits**

Operation and advanced diagnosis of modern automobile ignition, electrical, engine mechanical, and fuel and emission control systems which are computer controlled. Explore methods of analyzing and locating engine performance malfunctions using deductive methodology and diagnostic test equipment. Emphasis on OBD II (On-Board Diagnostic System) software, in-depth scan tool usage, five-gas analysis, and digital scope signal analysis of components and computer networks.

*Lecture: 1 hour. Laboratory: 6 hours*

*Prerequisite(s): AUTO-2400 Engine Performance; or departmental approval: industry related experience.*

### **AUTO-2505 Automotive Electrical Diagnosis for General Motors ASEP**

#### **3 Credits**

Covers diagnosing electrical concerns on General Motors vehicles. Includes instructor led content along with hands-on activities. Participants will have the opportunity to learn about the different testing equipment, demonstrate how to use the equipment to run a variety of tests and learn how to develop an action plan to aid them in thorough diagnosis. Encourages problem-based learning. Upon completion, students should be able to properly use wiring diagrams, diagnose, test, and repair wiring, lighting, gauges, accessories, modules, and electronic concerns.

*Lecture: 2 hours. Laboratory: 3 hours*

*Prerequisite(s): AUTO-1510 Automotive Electrical Systems; or departmental approval: industry-related experience.*

### **AUTO-2650 Hybrid Vehicle Safety and Service**

#### **3 Credits**

Working safely with hybrid vehicles is reviewed and practiced. Advantages and disadvantages of various battery types, hybrid designs and electric motors are examined. Hands-on course utilizes scan tools and diagnostic process to analyze and troubleshoot hybrid vehicles.

*Lecture: 2 hours. Laboratory: 2 hours*

*Prerequisite(s): AUTO-1502 Automotive Electrical Fundamentals, or departmental approval.*

### **AUTO-2701 Automotive Service Operations**

#### **3 Credits**

Staffing and personnel selection, customer relations, consumer laws, expense control, repair facility site selection, hiring/firing legal issues, advertising and other business concerns dealing with an automotive repair facility are examined. Daily operations, business analysis and marketing for an automotive garage are explored with auto service computer software.

*Lecture: 3 hours*

*Prerequisite(s): ENG-1010 College Composition I, or departmental approval.*

### **AUTO-2812 Special Topics in Automotive Projects**

#### **3 Credits**

Course provides students ability to work continuously on a specialty long term vehicle project(s) on student or automotive technology owned vehicles. Projects are selected by their instructor before the course is scheduled to begin taking into concern student interests and desires to build on their automotive experience. Projects are guided and/or instructed to completion with the assistance of an ASE Master Certified automotive instructor. Students must provide resources to complete projects on privately owned vehicles.

*Lecture: 2 hours. Laboratory: 2 hours*

*Prerequisite(s): Students must have completed nine (9) credits of automotive technology courses with a C grade or better, or department approval.*

### **AUTO-2820 Independent Advanced Study in Automotive Technology**

#### **1-3 Credits**

Directed individual advanced study. Study/research title and specific content arranged between instructor and student. May be repeated for a maximum of six credits of different topics.

*Lecture: 1-3 hours*

*Prerequisite(s): Departmental approval, and instructor approval, and ENG-0995 Applied College Literacies, or appropriate score on English Placement Test. Note: ENG-0990 Language Fundamentals II taken prior to Fall 2021 will also meet prerequisite requirements.*

**AUTO-2830 Cooperative Field Experience****1-3 Credits**

Limited to students in Cooperative Education Program. Employment in an approved training facility under College supervision. Requirements for one credit is 180 hours of approved work. Students may earn up to three credits in one semester. May be repeated for an accrued maximum of 9 credits.

*Other Required Hours: 180 clock hours of approved work per credit hour.*

*Prerequisite(s): Formal application into the Cooperative Education Program.*

**AUTO-2940 Automotive Field Experience IV****1 Credit**

Provides student with automotive field experience needed to develop career skills through work experience in automotive service industry.

*Other Required Hours: Field experience: 180 clock hours per semester.*

*Prerequisite(s): Departmental approval: job site approval.*

**AUTO-2950 Automotive Field Experience V****1 Credit**

Capstone Course in Automotive Technology. Provides student with automotive field experience needed to develop career skills through work experience in automotive service industry.

*Other Required Hours: Field experience: 180 clock hours per semester.*

*Prerequisite(s): Departmental approval: job site approval.*