

AUTOMOTIVE TECHNOLOGY (AUTO)

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): MATH-0910 Basic Arithmetic and Pre-Algebra, or appropriate math placement score; or departmental approval.

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.

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. 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 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-1501 Automotive Electrical Fundamentals, or departmental approval.

AUTO-2701 Automotive Service Operations

3 Credits

Staffing and personal 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-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.