

## Automotive Course Description

**100-3 Automotive Laboratory Practices.** Course covers universal automotive shop practices including safety, tool usage, fasteners, sealants and measurement devices. Lecture topics cover safety and environmental concerns, service information retrieval, and correct application of sealants and fasteners. Laboratory activities include thread repair, automotive measurements, electrical repair, and cutting/grinding equipment usage. Restricted to major. Fee: \$36.

**120-3 Automotive Electrical Principles.** A course of study in the design and theory of automotive electrical circuits. Particular emphasis placed on the study of how electricity behaves in series and parallel DC circuits, general application of these theories to automotive electrical systems, and the proper use of typical electronic and electrical circuit diagnostic equipment. Also emphasizes the understanding of automotive wiring diagrams, and relay and solenoid operation. Restricted to major. Lab fee: \$36.

**150-6 Internal Combustion Engine Principles.** Course combines the study of engine operational theory with practical technical skills. Content emphasizes the 720 degree power cycle and the dynamics of engine operation, design and efficiency (thermal, mechanical & volumetric). Laboratory experience consists of engine disassembly, component design study, inspection and measurement of components and engine assembly techniques. Restricted to major. Fee: \$72.

**170-6 Automotive Powertrain Electronics.** Course includes design and operation of solid state devices, wiring, batteries, starting and charging systems, and basic powertrain control systems. Lectures emphasize the operation of these systems and their individual components. Emphasis placed on system diagnosis. Laboratories allow the study of digital multimeters, battery/starting/charging system test equipment and scan tools. Restricted to major. Lab fee: \$72.

**180-3 Manual Drivetrains.** A detailed study of automotive manual transmission and transaxle assemblies, clutch assemblies, drive axles, and four-wheel drive transfer cases, including an introduction to noise, vibration, and harshness (NVH) diagnostics. Lectures focus on the basic theory of operation and diagnostics of the automotive drivetrain. Laboratory experience provides the opportunity to study approved inspection, maintenance, and diagnostic procedures. Restricted to major. Lab fee: \$36.

**215-3 Automotive Braking Systems.** Course covers brake system design, operation and diagnosis. Lectures describe brake system component interrelationships and an introduction to ABS. Special emphasis placed on component diagnosis and maintenance procedures. Laboratory experience provides students the opportunity to use specialized tools, such as on-the-car lathes, brake bleeding equipment, and brake system diagnostic equipment. Restricted to major. Special approval needed from the advisor. Lab fee: \$36.

**216-3 Automotive Suspension and Steering Systems.** Course covers suspension and steering system design, operation,

maintenance and diagnosis. Emphasis is placed on component diagnosis and maintenance procedures. Laboratory experience provides students the opportunity to use computerized alignment, wheel balance and vibration correction equipment. Restricted to major. Special approval needed from the advisor. Lab fee: \$36.

**240-6 Engine Management I.** A study of automotive engine electronics. Lectures focus on engine control circuits, fuel injection and ignition systems with emphasis on operation, application and diagnosis. Discussion topics include operational strategies, fuel delivery, sensor inputs and actuator outputs. Laboratory includes the use of electronic diagnostic tools for engine performance diagnosis. Prerequisite: AUT 150 & AUT 170. Restricted to major. Special approval needed from advisor. Lab fee: \$72.

**250-3 Engine Management II.** The specialized study of automotive fuels, electronic fuel injection systems, and related emission control systems. Lectures focus on the operational and diagnosis of electronic fuel injection systems and emission control systems. Laboratory experience provides the opportunity to study the use of electronic diagnostic tools, specialized equipment, and diagnostic systems. Co-requisite: AUT 240. Restricted to major. Special approval needed from the advisor. Lab fee: \$36.

**258-1 to 30 Automotive Work Experience.** A designation for credit granted for past documented automotive job skills, management-worker relations and supervisory practice gained through experiences related to the student's academic and career objectives. Credit will be established by departmental evaluation. This credit may be applied only to 100 and 200 level automotive technical courses as determined by the department coordinator. Restricted to automotive technology major.

**259-1 to 40 Automotive Occupational Training.** A designation for credit granted for past documented automotive educational experiences related to the student's educational objectives. Credit will be established by departmental evaluation. This credit may be applied only to 100 and 200 level automotive technical courses as determined by the department coordinator. Restricted to automotive technology major.

**280-3 Automotive Air Conditioning Systems.** A study of refrigeration systems, temperature controls, and automotive HVAC vacuum/electrical circuits. Emphasis placed on environmental impact of refrigerants, environmentally safe refrigerant technology and applicable legislation. Laboratory experiences provide the opportunity to study the use of air conditioning system diagnostic tools, refrigerant recovery/recycling equipment, and diagnostic and repair services. Prerequisite: AUT 170. Restricted to major. Special approval needed from the advisor. Lab fee: \$36.

**299-1 to 16 Individual Study.** Provides students with opportunity to develop a special program of study to fit a particular need not met by other offerings. Each student will work under the supervision of a sponsoring faculty. Special approval needed from the department.

**320-1 to 12 Automotive Internship.** Students will participate in a program approved automotive related internship that

includes formal instruction, training and/or career related work experience. Students receive a salary or wages and engage in prearranged assignments related to their academic program and career objectives. Program faculty evaluations, supervisor performance evaluations, and student reports are required. Internship experiences may be in one of the following areas: automotive service technical, engineering, parts, business, management, training, or government agencies. Hours and credits to be individually arranged. Restricted to major. Special approval needed from the advisor.

**325-3 Automotive Fixed Operations Management.** An introduction to management of automotive retail fixed operations. A study of the automotive retail industry and environment, developing concepts and methods to improve customer satisfaction along with an increase in market penetration, profits and efficiency are emphasized. Planning of workflow control and human resource management will be included. This course is writing intensive and reflects the Colleges' Communication-Across-the-Curriculum initiative. Prerequisite: ENGL 101. Restricted to major. Special approval needed from the advisor.

**330-3 Vehicle Stability and NVH.** Suspension and braking control systems that provide additional safety to vehicle operation. Topics covered include antilock brakes, traction control, electronic stability assist, electronic power steering, variable power steering, active suspensions, and tire pressure monitoring. Course includes techniques in diagnosing noise, vibration and harshness (NVH) concerns. Restricted to major. Special approval needed from the advisor. Lab fee: \$36.

**335-3 Computing for Automotive Applications.** Course covers the use of computers and computer systems in the automotive industry. Course uses software and hardware packages in practical automotive industry applications. Course emphasis is on the use of computer based software packages used as management and communication tools. Fee: \$15.

**340-6 Drivability and Emission Diagnostics.** An in-depth study of electronic engine controls and emission systems. Lectures focus on fuel analysis, advanced diagnostics, legislative regulations and new technologies related to engine controls and emission systems. Laboratory activities include the use of advanced diagnostic tools such as oscilloscopes, scan tools, exhaust gas analyzers, and chassis dynamometer. Restricted to major. Special approval needed from the advisor. Lab fee: \$72.

**345-3 Automotive Data Management and Analysis.** The course covers theory of automotive industry spreadsheet and database management system application and implementation, application of automotive industry proprietary software, and analysis of data for use in decision-making processes. Laboratory provides the opportunity to apply theory in problem based case studies. Prerequisite: AUT 335 or CS 200B. Restricted to major. Fee: \$15.

**355-6 Lighting, Convenience, and Safety Systems.** Course covers theory of operation and diagnosis of standard body electrical systems. Topics include power windows, power door locks, power seats, lighting, instrumentation, cruise control, and supplemental restraints. Emphasis is placed on analysis of electrical diagrams and development of diagnostic techniques.

Laboratory provides the opportunity to practice troubleshooting skills. Restricted to major. Special approval needed from the advisor. Lab fee: \$72.

**358-1 to 30 Automotive Management Work Experience.** A designation for credit granted for past documented automotive management work experiences related to the student's educational objectives. Credit will be established by departmental evaluation. This credit may be applied only to automotive technical, business/management, or support courses requirement of the automotive technology degree as determined by the department chair. Restricted to major. Special approval needed from the advisor.

**359-1 to 60 Automotive Education Credit.** A designation for credit granted for past documented automotive educational experiences related to the student's educational objectives. Credit will be established by departmental evaluation. This credit may be applied only to automotive technical, business/management, or support courses requirement of the automotive technology degree as determined by the department chair. Restricted to major. Special approval needed from the advisor.

**360-6 Automotive Transmissions and Transaxles.** Course covers the theory of operation, diagnosis, and repair of modern transmissions. The course will break down the transmission into basic components and provide the depth required for complete understanding of the specific transmission. The laboratory will allow students to understand correct service procedures, and test the transmission on a dynamometer. Restricted to major. Special approval needed from the advisor. Lab fee: \$72.

**390-3 Network Systems and Vehicle Electronics.** A study of specialized body electrical systems. Topics include advanced air bag systems, data communication networks, theft deterrent systems, automatic temperature controls, and audio systems. Emphasis is placed on current and developing technologies. Laboratory experiences provide the opportunity to use scan tools, oscilloscopes, and on-board self-diagnostic systems. Restricted to major. Special approval needed from the advisor. Lab fee: \$36.

**420-1 to 12 Automotive Service Operations Internship.** Each student will be assigned to a University approved work site to engage in work experience related to the Automotive Technology curriculum and the student's career objectives. The student will perform duties and services as assigned by the work site supervisor and internship coordinator. A written assignment is also required as determined by the program. One hundred hours of successfully completed work is required for each semester hour of credit. Not for graduate credit. Restricted to senior standing, major. Special approval needed from the

**430-1 to 3 Automotive Investigations.** Provides opportunities for students to conduct research in such areas as: emission and clean air testing; diagnostic software debugging; diagnostic methods; development of training information; alternative fuel systems; business operations; management/marketing practices; and production systems. Independent study. Student can take a maximum of 9 hours toward degree. Restricted to Major. Special approval needed from the advisor.

**435-3 Automotive Financial Management and Operations.**

This course will provide insight into automotive dealership business management with emphasis on application to daily work. Studies will focus on interpretations of financial statements and on business management techniques essential to successful dealership operations. Not for graduate credit.

Restricted to major. Special approval needed from the advisor.

**440-3 Diesel Engine Performance and Emissions.** An indepth study of electronic diesel engine controls and emission systems. Lectures focus on electronic fuel and intake air system controls, advanced diagnostics, legislative regulations and new technologies related to diesel engine controls and emission systems. Laboratory activities include the use of advanced diagnostic tools and equipment. Restricted to major. Special approval needed from the advisor.

**475-1-8 Special Projects in Automotive Technology.** Investigation of contemporary problems and issues within the automotive service field. Example subjects include state and federally mandated vehicle emission laws; safety; required inspection and maintenance procedures; consumer protection legislation - lemon laws; on-board diagnostic systems; hazardous automotive waste materials regulations; automotive retail management systems and procedures. Independent study. Not for graduate credit. Restricted to junior standing, major. Special approval needed from the advisor.

**480-3 Alternative Fueled Vehicles.** Study of alternative fuel and energy systems, fuel delivery systems, alternative propulsion systems, hybrid and alternative propulsion. Study of energy conversion, battery design, fuel cells, renewable and fossil fuel. Environmental concerns with current legislative actions will be discussed. Laboratory includes demonstrations with alternative fueled propulsion. Not for graduate credit. Restricted to major. Special approval needed from the advisor. Lab fee: \$36.

**485-3 Automotive Warranty Administration and Customer Relations.** This course investigates the various federal and state laws and regulations impacting the operations of the automotive wholesale and retail business. There will be specific concentration on the warranty policies of automotive manufacturers, warranty decisions, law covering warranties, and the legal aspects of product campaigns. Emphasis will be placed on the use of the warranty and goodwill process to increase customer satisfaction. Not for graduate credit. Restricted to major. Special approval needed from the advisor.

**490-6 Comprehensive Vehicle Diagnostics.** Course encompasses all technical areas of the vehicle with emphasis on diagnostic strategies and routines. Students engage in systematic diagnosis following the Symptom to System to Component to Cause (SSCC) strategy to determine the root cause of failure. Course utilizes problem-based learning through the use of lab vehicles, experiments and exploratory research. Not for graduate credit. Prerequisites: AUT 335 or CS 200B, AUT 340, or consent of department. Restricted to major. Special approval needed from the advisor. Lab fee: \$72.