Automotive Technology

The Automotive Technology program in the College of Applied Sciences and Arts provides students with an opportunity to obtain a solid foundation of knowledge, experience and skills that will assist in job entry and career advancement in the automotive industry.

Current automotive trends indicate that the automobile will continue to experience changes that include expanded use of electronics and computerized controls for improving engine performance, fuel efficiency, on-board diagnostics, exhaust emissions, and passenger comfort and safety. These changes will require persons knowledgeable and highly skilled in specialized areas of automotive technology. This program offers the student an opportunity to specialize in chosen automotive subject areas and offers the opportunity to develop technical, communication and supervisory skills. The student should expect to spend about $1,500 for a required basic tool kit consisting of metric tools and a digital multimeter.

The Automotive Technology program has achieved master certification by the National Institute for Automotive Service Excellence (ASE). Instruction is offered in all eight areas of ASE certification—engine repair, automatic transmissions/transaxles, manual drive trains and axles, suspension and steering, brakes, electrical/electronic systems, heating and air conditioning, and engine performance. Students are encouraged to complete the certification process by taking the ASE certification exams.


Bachelor of Science Degree

The Bachelor of Science Degree in Automotive Technology is designed to provide an educational environment for students to acquire the professional, research, and technical skills necessary for success in the automotive and related industries. The degree provides theoretical and practical hands-on application of knowledge through a combination of automotive technical courses and automotive business/management courses, along with computing and communication courses. The flexibility of the curriculum accommodates the needs of both incoming freshmen and transfer students. Students have the option of focusing on multiple areas of emphasis, earning a minor, and possibly earning dual degrees. Students can adjust their focus in areas such as: automotive technical, automotive business operations, automotive management, automotive technical education, marketing, and management.

The program can strengthen previous automotive training and the Capstone Option is available to qualified A.A.S. graduates entering the Automotive Technology bachelor’s degree program as explained in this catalog.

Automotive and truck manufacturers, component manufacturers and suppliers, government agencies, insurance organizations, educational institutions, training and curriculum organizations, and service providers are seeking four-year automotive technology graduates. The number of job titles in the area of automotive technology reflects the nature of a diverse and expanding field. Job titles include field service engineer, technical assistance specialist, serviceability engineer, district parts/service manager, customer support manager, automotive instructor, account manager, fleet manager, service advisor, dealership service manager, technical training specialist, district sales manager, field executive, technical writer, and
product engineer. These positions require a four-year degree with skills in communications, management and consumer relations as well as technical knowledge.

**Admission to Automotive Technology**

Those interested in applying to the Automotive Technology program are encouraged to begin the application process approximately one year in advance. Admission requirements to the applicant pool are the same as those to the University. After acceptance to the University and indicating Automotive Technology as the primary intended major, students are placed into the Automotive Technology Applicant Pool. No separate application is needed. Additional review of applicants will occur on predetermined dates for possible acceptance into the Automotive Technology major. The review criteria and dates are available from the Department and are on the Department’s website: automotive.siu.edu.

The Automotive Technology Program welcomes students with AAS degrees in Automotive Technology from regionally accredited colleges. These students may qualify for the Capstone Option (see Capstone section) which reduces the overall Core Curriculum requirements necessary for the bachelor’s degree. If you have questions about what classes are needed to qualify for the Capstone Option, contact your community college advisor and the Automotive Technology program.

**Internship Programs**

Automotive Technology majors can participate in paid internship experiences and may be able to earn credit toward graduation. Opportunities occur during all semesters (including the summer term), with some programs available for two sequential terms. Internship sites are situated in various locations throughout the United States. Internship opportunities may be available with Fiat Chrysler Automobiles, Cummins Inc., Toyota Motor Sales, U.S.A., Inc., Eaton Corporation, General Motors Company, Robert Bosch Corporation, Ford Motor Company, Sherwin-Williams Automotive Finishes, Motors Insurance Corporation, General Services Administration (GSA) of the Federal Government, and other various automotive businesses.

**Bachelor of Science Degree in Automotive Technology, College of Applied Sciences and Arts**

<table>
<thead>
<tr>
<th>Degree Requirements</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>University Core Curriculum (^{1})</td>
<td>41</td>
</tr>
<tr>
<td>Requirements for Major in Automotive Technology</td>
<td>79</td>
</tr>
<tr>
<td>Category II: AUT 100 and AUT 200 level courses: (or Approved Substitutions)</td>
<td>36</td>
</tr>
<tr>
<td>AUT 120, AUT 150, AUT 170, AUT 180, AUT 215, AUT 216, AUT 240, AUT 250 and AUT 280 Category III: AUT 300 and 400 technical courses: (or Approved Substitutions) Select from: AUT 330, AUT 340, AUT 355, AUT 360, AUT 370, AUT 390, AUT 440, AUT 445, AUT 450, AUT 480, AUT 490 (^{2})</td>
<td>15</td>
</tr>
<tr>
<td>Category IV: Business/Management Courses (or Approved Substitutions)</td>
<td>15</td>
</tr>
</tbody>
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\(^{1}\) University Core Curriculum

\(^{2}\) Some approved substitutions are allowed.
<table>
<thead>
<tr>
<th>Degree Requirements</th>
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<tbody>
<tr>
<td>Group I: Select one course from the following: AUT 310, TRM 316</td>
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<tr>
<td>Group II: Select one course from the following: AUT 335</td>
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<tr>
<td>Group III: Select one course from the following: AUT 325, MGMT 304, MGMT 350, TRM 364</td>
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<tr>
<td>Group IV: Select two courses from the following: AUT 345, AUT 435, AUT 485, ACCT 210, FIN 208, FIN 270, FN 280, MKTG 304, MKTG 305, MKTG 350, PSYC 323, TRM 361, TRM 362, TRM 383</td>
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<tr>
<td>Category V: Support Courses selected from the following:</td>
<td>13</td>
</tr>
<tr>
<td>Any Category III course not previously taken Any Category IV Group III or Group IV course not previously taken Credit from AUT 320, AUT 420, AUT 430, AUT 475, MGMT 318, MGMT 341, MKTG 329, MKTG 336, MKTG 401, TRM 361, TRM 362, WED 460, WED 462, WED 463 Or Department approved substitutions</td>
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<tr>
<td>Total</td>
<td>120</td>
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</tbody>
</table>

1 Capstone = 30; UCC = 41.
2 Consent of department.
3 Note: Credit from all areas must total a minimum of 42 hours of 300- and 400-level courses. Degree requires a total of 120 credit hours.

## Automotive Technology Courses

**AUT100 - Automotive Lab Practices** 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.

**AUT120 - Auto Electrical Principles** 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: $45.

**AUT150 - Int Combust Engine Principles** 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: $90.

**AUT170 - Auto Powertrain Electronics** 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: $120.

**AUT180 - Manual Drivetrains** 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: $60.

**AUT215 - Automotive Braking Systems** 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: $105.

**AUT216 - Suspension & Steering Systems** 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: $105.

**AUT240 - Intro to Engine Controls** 240-6 Introduction to Engine Controls. 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 or consent of the department. Restricted to major. Special approval needed from the advisor. Lab fee: $105.

**AUT250 - On Board Diag & Emissions** 250-3 On Board Diagnostics and Emissions. 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. Prerequisites: AUT 150 and AUT 170 or consent of department. Restricted to major. Special approval needed from the advisor. Lab fee: $75.

**AUT280 - Auto Air Cond Systems** 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 systems, refrigeration, and temperature controls.
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: $75.

AUT299 - Individual Study 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.

AUT310 - Auto Tech Communications 310-3 Automotive Technical Communications and Documentation. This course engages students in the study of technical communications and documentation skills used by managers and technical experts in the automotive industry. Foundations of technical communication and documentation are followed by the application of automotive industry specific examples. Emphasis will be placed on critical thinking, documentation and communication in the appropriate industry context. Prerequisite: ENGL 101 and CMST 101, or consent of department. Restricted to major. Special approval needed from the advisor.

AUT320 - Automotive Internship 320-1 to 6 Automotive Internship. Students will participate in a program approved automotive related internship that includes formal instruction, training and/or career related work experiences. 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. Students can take a maximum of 15 hours toward degree. Restricted to major. Special approval needed from the advisor.

AUT325 - Auto Fixed Operations Mgt 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.

AUT330 - Vehicle Stability & NVH 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.

AUT335 - Auto Data Systems 335-3 Automotive Data Systems. Course introduces software and hardware tools used in the automotive industry through project-based learning exercises relevant to automotive technology applications. Topics include automotive information systems, automotive diagnostic systems, and an introduction to microcontrollers. Lab fee: $15.

AUT340 - Drivability & Emission Diagnost 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: $180.

AUT345 - Adv Auto Data Systems 345-3 Advanced Automotive Data Systems. Course is an in-depth study of the tools and methods used in the acquisition, analysis, warehousing, and dissemination of automotive data. Emphasis is on advanced spreadsheet and database techniques used in decision-making processes. Other topics include an introduction to automotive data communication technologies and data networks. Prerequisite: AUT 335 or consent of department. Restricted to major. Lab fee: $15.

AUT355 - Convenience & Safety Sys 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: $150.

**AUT358 - Auto Mgt Work Experience** 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.

**AUT359 - Auto Education Credit** 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.

**AUT360 - Auto Transmission & Transaxle** 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: $150.

**AUT370 - Auto Welding and Fabrication** 370-3 Automotive Introductory Welding and Fabrication. Course covers introductory topics of metal cutting, welding and shaping applicable to the automotive industry practice. Lectures focus on setup, operation and maintenance of equipment such as oxygen-acetylene systems as well as Stick, MIG, and TIG welders. Laboratory activities include the use of equipment to develop and improve skills. Not for graduate credit. Restricted to major. Special approval needed from the advisor. Lab fee: $120.

**AUT390 - Network Sys & Vehi Electronics** 390-3 Network Systems and Vehicle Electronics. A study of specialized body electrical systems. Topics include 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: $60.

**AUT420 - Auto Service Operations Intern** 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 advisor.

**AUT430 - Automotive Investigations** 430-1 to 6 Automotive Investigations. Provides opportunities for students to conduct research in such areas as: green vehicle technology, emissions 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 15 hours toward degree. Restricted to major. Special approval needed from the advisor.

**AUT435 - Auto Financial Mgt & Operation** 435-3 Automotive Financial Management and Operations. This course will provide insight into the applied analysis and management of automotive retail dealership financial operations. Studies will focus on fixed and variable operations with emphasis on manufacturer/dealer performance expectations, and management techniques essential to successful operations. Not for graduate credit. Special approval needed from the advisor.

**AUT440 - Diesel Perform & Emissions** 440-6 Diesel Engine Performance and Emissions. An in-depth 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. Fee: $180.

Course encompasses commercial vehicle chassis and body systems related to medium and heavy duty
on-road vehicles. Students engage in body/chassis system failures, diagnostic strategies and root causal
issues. Class is based on Symptom to System to Component to Cause (SSCC) strategy to determine
failure and repair procedures. Course utilizes problem-based learning through the use of lab vehicles,
experiments and exploratory research. Not for graduate credit. Restricted to major. Special approval
needed from the advisor. Lab fee: $120.

**AUT450 - Hybrid & Elec Veh Tech** 450-3 Hybrid and Electric Vehicle Technology. This course
introduces and investigates hybrid electric and electric vehicle technologies through lecture and
laboratory demonstrations. Emphasis will be placed on developing an understanding of the functions of
hybrid/electric components and subsystems, the diagnosis and maintenance of electrical subsystems,
and high-voltage/high current safety practices. Prerequisite: AUT 250 or consent of department. Special
approval needed from the advisor. Fee: $120.

**AUT475 - Special Projects in Auto** 475-1 to 6 Special Projects in Automotive Technology. Investigation
of contemporary issues within the automotive, ground transportation and power generation fields.
Example subjects include emission laws and regulations; passenger and pedestrian safety; inspection,
maintenance, diagnostic, and servicing procedures; consumer protection legislation; diagnostic
systems; waste material regulations; industry wholesale and retail business operations and procedures.
Independent study. Student can take a maximum of 15 hours toward degree. Restricted to major. Special
approval needed from the advisor.

**AUT480 - Alternative Fueled Vehicles** 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: $60.

**AUT485 - Warranty Admin & Cust Relation** 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.

**AUT490 - Comp Vehicle Diagnostics** 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 use of lab vehicles,
experiments and exploratory research. Not for graduate credit. Prerequisites: AUT 335, AUT 340 or 440,
or consent of department. Restricted to major. Special approval needed from the advisor. Lab fee: $180.

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**Automotive Technology Faculty**

Behrmann, Michael, Associate Professor and Chair, M.S.Ed., Southern Illinois University Carbondale,
1995.


Boyle, Sean M., Associate Professor, M.S.Ed., Southern Illinois University Carbondale, 1996.

Collard, Rodney, Associate Professor, M.S.Ed., Southern Illinois University Carbondale, 1990.

Croxell, Andrew, Assistant Professor, M.S.Ed., Southern Illinois University Carbondale, 2010.

Gilbert, David W., Associate Professor, Ph.D., Southern Illinois University Carbondale, 2006.

Heisner, Blaine, Assistant Professor, M.S.Ed., Southern Illinois University, 2010.
Janello, Tim, Associate Professor, M.S.Ed., Southern Illinois University Carbondale, 2008.
Meckfessel, Kent E., Assistant Instructor, B.S, Southern Illinois University Carbondale, 1996.
Pickerill, Ken, Assistant Instructor, M.S.Ed., Indiana State University, 2008.
Simpson, Jerry, Assistant Professor, Emeritus, M.S., Colorado State University, 1966.
Tate, Ralph F., Associate Professor, M.S., Air Force Institute of Technology, 1991.

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Southern Illinois University
Carbondale, IL 62901
Phone: (618) 453-2121

Catalog Year Statement:
Students starting their collegiate training during the period of time covered by this catalog (see bottom of this page) are subject to the curricular requirements as specified herein. The requirements herein will extend for a seven calendar-year period from the date of entry for baccalaureate programs and three years for associate programs. Should the University change the course requirements contained herein subsequently, students are assured that necessary adjustments will be made so that no additional time is required of them.