

Automotive Technology, A.A.S.

Automotive technicians generally begin their careers in service repair shops, with continually expanding industrial and service career advancement opportunities. Technicians work with experienced professionals and have frequent contact with the public. This field requires good mechanical aptitude and manual dexterity skills.

The two-year associate of applied science degree, which is certified by the ASE, covers all major areas, including diagnosis and tune-up, chassis, electrical/electronic and hydraulic systems, automatic transmissions, engines, and emissions. Students work on developing the skills needed to advance to a supervisory position, such as customer relations, estimating materials and labor costs, and managing the work of others.

(Major Code 2420; State CIP Code 47.0604)

- Automotive (<http://www.jccc.edu/automotive>)

Associate of Applied Science Degree

First Semester

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|-------------|---|----|
| AUTO 125 | Introduction to Automotive Shop Practices | 3 |
| AUTO 129 | Brakes I* | 3 |
| AUTO 131 | Brakes II* | 1 |
| AUTO 156 | Electrical I* | 3 |
| AUTO 145 | Automotive Steering and Suspension* | 4 |
| ENGL 121 | Composition I* | 3 |
| Total Hours | | 17 |

Second Semester

| | | |
|---|---------------------------|----|
| INDT 125 | Industrial Safety/OSHA 30 | 3 |
| AUTO 166 | Electrical II* | 2 |
| AUTO 161 | Engine Performance I* | 3 |
| AUTO 165 | Automotive Engine Repair* | 4 |
| INDT 155 | Workplace Skills | 1 |
| Health and/or Physical Education Elective ^ | | 1 |
| Humanities Elective ^^ | | 3 |
| Total Hours | | 17 |

^ Health and/or Physical Education Elective (<http://catalog.jccc.edu/spring/degreecertificates/electives/health-and-or-physical-ed-aas>)

^^ Humanities Elective (<http://catalog.jccc.edu/spring/degreecertificates/electives/humanities-aas>)

Third Semester

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|-------------|-------------------------------|----|
| AUTO 208 | Electrical III* | 3 |
| AUTO 205 | Engine Performance II* | 3 |
| AUTO 209 | Manual Drive Train and Axles* | 4 |
| ENGL 123 | Technical Writing I* | 3 |
| MATH 120 | Business Mathematics* | 3 |
| Total Hours | | 16 |

Note: Students transferring to 4 year programs should take MATH 171 College Algebra*.

Fourth Semester

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| Technical/Related Electives (see below) | | 3 |
| AUTO 250 | Automatic Transmissions and Transaxles* | 4 |
| AUTO 215 | Engine Performance III* | 3 |
| AUTO 221 | Heating and Air Conditioning* | 4 |

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|--|----|
| Social Science and/or Economics Elective ^ | 3 |
| Total Hours | 17 |

^ Social Science and/or Economics Elective (<http://catalog.jccc.edu/spring/degrecertificates/electives/social-sci-econ-aas>)

Technical/Related Electives

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|----------|---|-----|
| AUTO 120 | Basic Automobile Operation and Maintenance | 3 |
| AUTO 121 | Small Engine Service | 3 |
| AUTO 122 | Introduction to Automotive Glass | 3 |
| AUTO 123 | Motorcycle Maintenance and Repair | 2 |
| AUTO 128 | Automotive Parts Specialist | 2 |
| AUTO 130 | Diesel Fundamentals* | 2 |
| AUTO 201 | ASE Certification Seminar | 1 |
| AUTO 210 | Advanced Engine Repair* | 3 |
| AUTO 235 | Hybrid & Alternative Fuels Vehicles Repair & Maintenance* | 3 |
| AUTO 271 | Automotive Technology Internship* | 3 |
| AUTO 291 | Independent Study* | 1-7 |
| ENTR 142 | Fast Trac Business Plan | 3 |

Total Program Hours: 67

Courses

AUTO 120 Basic Automobile Operation and Maintenance* (3 Hours)

Prerequisites or corequisites: RDG 126 or College Reading Readiness

This is a beginning level class for non-automotive majors, designed to introduce students to the basic function, operation and care of modern automobiles. Upon completion they should be able to discuss safe operation of a passenger car in everyday circumstances including emergency situations. Students should be able to locate and understand information regarding repair and maintenance of modern automobiles. Safe practices while using basic hand tools, chemicals and jacks will be included in this course. After determining fair market costs and economic feasibility students will be able to determine whether to repair or replace an automobile. Students should be able to decide whether to attempt repairs themselves or to have them performed by a professional. Also, the basic costs of insuring and operating an automobile will be discussed. 3 hrs. lecture/wk.

AUTO 121 Small Engine Service* (3 Hours)

Prerequisites or corequisites: RDG 126 or College Reading Readiness

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 122 Introduction to Automotive Glass* (3 Hours)

Prerequisites or corequisites: RDG 126 or College Reading Readiness

Upon successful completion of this course, the student should be able to diagnose, service and repair various automotive glass problems, provide professional service to customers, and manage and supervise jobs and employees. 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, 1 1/2 hrs. lab/wk.

AUTO 123 Motorcycle Maintenance and Repair* (2 Hours)

Prerequisites or corequisites: RDG 126 or College Reading Readiness

Upon successful completion of this course, the student should be able to demonstrate the proper use of tools and equipment used in servicing motorcycles. Two-stroke and four-stroke cycle designs will be studied. Overhaul procedures will be demonstrated. 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.

AUTO 125 Introduction to Automotive Shop Practices* (3 Hours)

Prerequisites or corequisites: RDG 126 or College Reading Readiness

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. The student will be required to provide American National Standards Institute (ANSI) Z87 safety glasses and is expected to provide other basic hand tools and/or equipment. 2 hrs. lecture, 3 hrs. lab/wk.

AUTO 128 Automotive Parts Specialist* (2 Hours)

Prerequisites or corequisites: RDG 126 or College Reading Readiness

Upon successful completion of this course, the student should be able to demonstrate good communication and basic math skills. Ordering and maintaining correct inventory, as well as displaying and selling automotive parts for a fair profit, will be studied. Lectures will be supported by parts specialists in the industry. 2 hrs. lecture/wk.

AUTO 129 Brakes I* (3 Hours)

Prerequisites or corequisites: AUTO 125 AND 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 AND 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 145 Automotive Steering and Suspension* (4 Hours)

Prerequisites or corequisites: AUTO 125

Upon successful completion of this course students will document suspension system concerns, perform diagnostics on steering systems, perform repairs on steering systems, perform diagnostics on suspension systems, perform repairs on suspension systems, determine the need for wheel alignment and adjustment, perform diagnostics on wheel and tire systems, and perform fundamental repairs on wheel and tire systems. 8 hrs. integrated lecture/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 158 Steering and Suspension I* (2 Hours)

Prerequisites or corequisites: AUTO 125 AND Corequisite: AUTO 159

In this course students will document fundamental suspension system concerns, perform fundamental diagnostics of steering systems, perform fundamental repairs of steering systems, perform fundamental diagnostics of suspension systems, perform fundamental repairs of suspension systems, determine the need for wheel alignment and adjustment, perform fundamental diagnostics of wheel and tire systems, and perform fundamental repairs of wheel and tire systems. 1 hr. lecture, 3 hrs. instructional lab/wk.

AUTO 159 Steering and Suspension II* (2 Hours)

Prerequisites or corequisites: AUTO 125 AND Corequisite: AUTO 158

Upon successful completion of this course, students should be able to perform complex diagnostics and repair on steering and suspension systems. Additionally, students will perform pre-alignment inspection and complex repairs of wheel and tire systems. 1 hr. lecture, 3 hrs. lecture/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 Seminar* (1 Hour)**Prerequisites or corequisites:** RDG 126 or College Reading Readiness

This course will prepare students to take any of the eight basic National Institute for Automotive Service Excellence (ASE) automotive 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 210 Advanced Engine Repair* (3 Hours)**Prerequisites:** AUTO 165

Upon successful completion of this course, the student should be able to plan, design, and build a performance engine. The student will also demonstrate knowledge of the relationships between displacement, horsepower and torque; regulations governing performance engines; and current trends in engine modification. 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, 6 hrs. lab/wk. This course is taught in the fall semester.

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.