

Automotive

Automotive Body and Repair

Program Description

This program is designed to prepare the student for employment as a body repair and paint apprentice in privately owned repair shops or automotive dealerships. A student could be self-employed from the training after completing the program.

Certificate of Achievement and Associate Degree in Science

A Certificate of Achievement can be obtained by completing the 46-unit major below. The Associate in Science Degree can be obtained by completing 67 units, including the major and the general education requirements. All courses in the major must be completed with a grade of C or better or a P if the course is taken on a Pass/No Pass basis.

Program Outcomes

Students who complete the Automotive Body and Repair Certificate of Achievement/ Associate Degree will be able to:

1. Demonstrate knowledge of metal joining and straightening methods.
2. Inspect, remove, install, align panels, doors and trim to meet shop standards
3. Determine type of paint; plan refinishing system; remove, prepare, seal and mask; apply coatings to vehicle.
4. Demonstrate correct use of chemicals within the shop environment.
5. Work safely and responsibly within all safety and environmental guideline standards for a shop.
6. Identify and strategize career plans for employment in the auto collision field.

REQUIRED COURSES	Units
AUTB 100 Fundamentals of Auto Body Repair	10
AUTB 101 Spray Paint Theory and Techniques	10
AUTB 102 Automotive Body Panels and Frame Straightening	10
AUTB 103 Advanced Auto Body Repair and Painting . .	10
IT 140 Industrial Materials	3
IT 150 Industrial Processes	3
Total Units	46

Recommended Electives

- BUS 005 Introduction to Business
- DRFT 079 Blueprint Reading
- IT 110 Modern Welding
- OCED 070 Occupational Soft Skills
- OCED 090 Occupational Work Experience
- OCED 091 General Work Experience

Some courses may not be offered. Please contact the Dean of Applied Technology and Business for alternate courses if necessary.

This is a Gainful Employment Program. For additional information, please visit http://www.solano.edu/gainful_employment/ and select "Automotive Body & Repair."

Automotive

Automotive Technician

Program Description

This program is designed to prepare graduates for employment in the automotive industry as apprentice mechanics, parts people, service station attendants or specialists in one of the many areas in, or jobs related to, the automotive industry.

Certificate of Achievement and Associate of Science Degree

A Certificate of Achievement can be obtained by completing the 40-unit major below. The Associate in Science Degree can be obtained upon completion of 61 units, including the major, and the general education requirements. All courses in the major must be completed with a grade of C or better or a P if the course is taken on a Pass/No Pass basis.

Program Outcomes

Students who complete the Automotive Technician Certificate of Achievement/ Associate Degree will be technically proficient in entry level skills as defined by the National Automotive Technician's Education Foundation. (NATEF) by demonstrating:

1. 85 percent of the tasks established by NATEF.
2. Proper service and repair procedures of the following systems:
 - Engine Repair
 - Automatic Transaxles/Transmissions
 - Manual Drivetrain
 - Suspension, Steering and Alignment
 - Brakes
 - Electrical Systems
 - Heating and Air Conditioning
 - Engine Performance
3. Proper safety procedures and techniques.
4. Efficient oral and written communication.
5. The ability to apply fundamental automotive technology principles.
6. Skills for successful employment in the field of Automotive Mechanics Repair Technology.

REQUIRED COURSES	Units
ATEC 130 Automotive Systems	10
ATEC 131 Automotive Electrical Systems	10
ATEC 132 Automotive Brakes and Suspension Systems	10
ATEC 133 Internal Combustion Engines and Power Transmission	10
Total Units	40

Recommended Electives
BUS 005 Introduction to Business
IT 110 Modern Welding
IT 140 Industrial Materials
OCED 070 Occupational Soft Skills
OCED 090 Occupational Work Experience
OCED 091 General Work Experience

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(For additional listings see "Industrial Education" section of this catalog.)

ATEC 070 3.0 Units **Automotive Fundamentals**

Course Advisory: SCC minimum English and Math standards. This course serves as the pre-requisite for all automotive technology certificate and/or degree applicable courses and provides the knowledge and skills needed to prepare students for entry into the automotive core curriculum. The study of automotive industry fundamentals including careers; safety; fasteners; hand tool identification and usage; vehicle systems; electrical fundamentals; service information access and use; automotive chemical and fluid applications; hazardous waste handling; general shop equipment usage, and vehicle servicing. The course is designed in conjunction with Automotive Service Excellence (ASE) standards and subsequently will in part prepare the student for the ASE Maintenance and Light Repair G1 Certification Examination. *Two hours lecture, three hours lab.*

ATEC 130 4.0 Units **Automotive Suspension and Steering**

Prerequisite: ATEC 070 with a minimum grade of C (may be taken concurrently). *Course Advisory:* ATEC 131 Automotive Electrical Systems, and SCC minimum English and Math standard. The study of automotive suspension and steering fundamentals including: Diagnosis, inspection, repair, and adjustment of modern automotive steering, suspension, supplemental restraint, tire pressure monitoring, and alignment systems. Theory of operation, common automotive steering and suspension systems, wheel alignment principles, methods of diagnosis, adjustment and repair, and the use of suspension service equipment will be covered. The course is designed in conjunction with Automotive Service Excellence (ASE) standards and subsequently will in part prepare the student for the ASE Suspension and Steering A4 Certification Examination. *Two hours lecture, six hours lab.*

ATEC 131 4.0 Units **Automotive Electrical Systems**

Prerequisite: ATEC 070 with a minimum grade of C (may be taken concurrently). *Course Advisory:* SCC minimum English and Math standard. A course covering theory and principles of automotive electrical systems. The course includes basic electrical theory, Ohm's Law, series and parallel circuits, electrical symbols and schematics, automotive batteries, charging systems, voltage regulation, starting systems, lighting systems, and various accessory systems. The laboratory portion of the course will place emphasis on diagnosis and testing techniques required to effectively determine the necessary action in an electrical system failure. The use of schematics, technical specifications, voltmeters, ohmmeters, ammeters, and circuit testers will be required. The course is designed in conjunction with Automotive Service Excellence (ASE) standards and subsequently will in part prepare the student for the ASE Electrical / Electronic A6 Certification Examination. *Two hours lecture, six hours lab.*

ATEC 132 4.0 Units **Automotive Brake Systems**

Prerequisite: ATEC 070 with a minimum grade of C (may be taken concurrently). *Course Advisory:* ATEC 131 Automotive Electrical Systems, and SCC minimum English and Math standard. The study of modern automotive braking systems. Hydraulic principles, coefficients of friction, and thermodynamics will be discussed. Diagnosis, repair, overhaul, and adjustment procedures of drum, disc/drum, and four-wheel disc systems will be emphasized. Anti-lock Braking Systems (ABS) diagnostics, servicing, and repair procedures will also be covered. The course will cover common domestic and import passenger vehicles, and light trucks only. The course is designed in conjunction with Automotive Service Excellence (ASE) standards and subsequently will prepare the student for the ASE Brakes A5 Certification Examination. *Two hours lecture, six hours lab.*

Automotive

ATEC 133

Automotive Engine Repair

Prerequisite: ATEC 070 with a minimum grade of C (may be taken concurrently). Course Advisory: ATEC 131 Automotive Electrical Systems, and SCC minimum English and Math standard. The study of four stroke combustion cycle theory, engine torque, horsepower, materials, and manufacturing processes as they relate to internal combustion powerplants used in production automobiles and light trucks. The theory, principles, and diagnosis of cooling systems, lubrication systems, and common engine mechanical failures will be emphasized. The laboratory portion of the course will focus on comprehensive engine testing, in-vehicle engine servicing, engine disassembly / reassembly, precision measuring, and inspection of internal engine components. The course is designed in conjunction with Automotive Service Excellence (ASE) standards and subsequently will prepare the student for the ASE Engine Repair A1 Certification Examination. *Two hours lecture, six hours lab.*

ATEC 134

Automatic Transmissions/Transaxles

Prerequisite: ATEC 070 with a minimum grade of C (may be taken concurrently). Course Advisory: ATEC 131 Automotive Electrical Systems, and SCC minimum English and Math standards. The study of hydraulic and electronically actuated automatic transmissions and transaxles. Topics will include positive and variable displacement pumps, torque converters, bands and clutches, hydraulic valves, electronic shift solenoids, governors, and common compound planetary gear arrangements. The laboratory portion of the course will focus on diagnostic and overhaul procedures, in-vehicle testing, and bench testing of various components. The course is designed in conjunction with Automotive Service Excellence (ASE) standards and subsequently will prepare the student for the ASE Automatic Transmission A2 Certification Examination. *Two hours lecture, six hours lab.*

4.0 Units

ATEC 135

Automotive Engine Performance

Prerequisite: ATEC 070 with minimum grade of C (may take concurrently), or equivalent. Course Advisory: SCC minimum English and Math standards. ATEC 131. Lecture, demonstration and practical lab experience in the operation, troubleshooting and repair of the ignition, fuel and emission control systems of import and domestic passenger vehicles and light trucks. Emphasis is on theoretical knowledge and the proper use of diagnostic tools and equipment. Prerequisite: ATEC 070 or equivalent (may be taken concurrently). The course is designed in conjunction with Automotive Service Excellence (ASE) standards and subsequently, will in part, prepare the student for the ASE Engine Performance A8 Certification Examination. *Two hours lecture, six hours lab.*

4.0 Units

ATEC 136

Automotive Manual Drivetrain and Axles

Prerequisite: ATEC 070 with a minimum grade of C (may be taken concurrently). Course Advisory: SCC minimum English and Math standards. A course covering theory and principles of manual transmissions / transaxles, clutches, driveshafts, half shafts, variable and constant velocity joints, differentials, rear wheel drive axle assemblies, all wheel drives, and four wheel drives. Gear types, ratios, and noise, vibration, harshness diagnostic routines will be discussed. Diagnosis, repair, overhaul, and adjustment procedures for common domestic, import, and light truck drivetrain components will be emphasized. The course is designed in conjunction with Automotive Service Excellence (ASE) standards and subsequently will prepare the student for the ASE Manual Transmission / Transaxle & Drivetrain A3 Certification Examination. *Two hours lecture, six hours lab.*

4.0 Units

Automotive

ATEC 137 **4.0 Units**
Automotive Heating and Air Conditioning

Prerequisite: ATEC 070 with a minimum grade of C, may be taken concurrently. An Automotive Technology course covering theory and operation of automotive heating systems and air conditioning refrigeration systems. Topics will include the refrigeration cycle, evacuation principles, humidity, heat transfer, automotive refrigerants, temperature pressure relationship, greenhouse gases, and proper handling and storage of refrigerants. The laboratory portion of the course will focus on the diagnosis and repair of heating and cooling systems, use of refrigerant recycling-reclaiming equipment, use of evacuation equipment, retrofitting, and environmentally sound refrigeration handling techniques. The course is designed in conjunction with Automotive Service Excellence (ASE) standards and subsequently, will prepare the student for the ASE A7 Air Conditioning and Heating Certification Examination. *Two hours lecture, six hours lab.*

ATEC 138 **4.0 Units**
Automotive Electronics

Prerequisite: Minimum grade of C in both ATEC 070 and ATEC 131. Emphasis on applied techniques in schematic reading, scan tool usage and diagnosis of various automotive electronic systems, including power doors, mirrors, windows and seats; sun roofs; air bags; keyless entry; networks and other body control electronics. This course builds on the concepts introduced in Automotive Electrical Systems. The course is designed in conjunction with Automotive Service Excellence (ASE) standards and subsequently will in part prepare the student for the ASE Electrical / Electronic A6 Certification Examination. *Two hours lecture, six hours lab.*

ATEC 139 **4.0 Units**
Advanced Engine Performance

Prerequisite: Complete each ATEC 070, ATEC 131 and ATEC 135 with a minimum grade of C. Emphasis on applied techniques in advanced engine performance systems diagnostics including fuel injection; ignition; emission controls; OBD II and CAN/BUS. The course is correlated with the National Institute for Automotive Service Excellence standards and is designed to prepare the student for the ASE A8 and L1 Engine Performance Certification Examination series. *Two hours lecture, six hours lab.*

ATEC 140 **2.0 Units**
Hybrid Vehicle Maintenance and Repair

Course Advisory: SCC minimum English and Math standards with a minimum grade of C. Study of hybrid vehicles, safety issues associated with hybrid vehicles, maintenance and repair procedures specific to hybrid vehicles. *One hour lecture, three hours lab.*

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(For additional listings see "Industrial Education" section of this catalog.)

AUTB 100 **10.0 Units**
Fundamentals of Auto Body Repair

Course Advisory: SCC minimum English standard. Acquaints the student with the basic skills and fundamental principles of auto body repair. Learned skills are verified through manipulative and written tests. *Five hours lecture, fifteen hours lab.*

AUTB 101 **10.0 Units**
Spray Paint Theory and Techniques

Prerequisite: AUTB 100. *Course Advisory:* SCC minimum English standard. Acquaints the student with the basic principles and techniques of automotive refinishing. Skills acquired are verified through manipulative projects and written tests. *Five hours lecture, fifteen hours lab.*

AUTB 102 **10.0 Units**
Automotive Body Panels and Frame Straightening

Prerequisite: AUTB 100. Students will learn to repair and replace body panels. Includes unibody and frame straightening. Learned skills are verified through manipulative projects and written exams. *Five hours lecture, fifteen hours lab.*

AUTB 103 **10.0 Units**
Advanced Auto Body Repair and Painting

Prerequisite: AUTB 101, 102. Students are exposed to the fine details of automotive body repair. Excellence and precision of skills are refined and quality work is emphasized. Students demonstrate their achievements through manipulative projects and written tests. *Five hours lecture, fifteen hours lab.*

AUTB 110 **3.0 Units**
Special Projects

Prerequisite: AUTB 103. Advanced projects undertaken by students in their field of specialization, under supervision of the instructor. *Two hours lecture, three hours lab.*