Automotive

Automotive Technician

Program Description
This program is designed to prepare graduates for entry level employment in the automotive industry as apprentice technicians, parts specialists, service consultants, or specialists in one of the many areas in the automotive service and repair industry.

Associate in Science Degree
The Associate in Science Degree can be obtained upon completion of the 45-unit major and general education requirements. All courses in the major must be completed with a minimum grade of C or a P if the course is taken on a Pass/No Pass basis.

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

1. Completion of 85 % of the tasks established by NATEF for the Master Automobile Service Technology Certification.
2. Proper service and repair procedures of the following systems:
   - Engine Repair
   - Light Duty Hybrid/Electric Vehicle
   - Automatic Transaxles/Transmissions
   - Manual Drivetrain
   - Suspension, Steering and Alignment
   - Brakes
   - Electrical/Electronic 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 Service and Repair
7. Appropriate methods for hazardous waste handling and disposal.

REQUIRED COURSES	**Units**
ATEC 070 Automotive Fundamentals	3
ATEC 130 Automotive Suspension and Steering	4
ATEC 131 Automotive Electrical Systems	4
ATEC 132 Automotive Brake Systems	4
ATEC 133 Automotive Engine Repair	4
ATEC 134 Automatic Transmissions/Transaxles	4
ATEC 135 Automotive Engine Performance	4
ATEC 136 Automotive Manual Drivetrain and Axles	4
ATEC 137 Automotive Heating and Air Conditioning	4
ATEC 138 Automotive Electronics	4
ATEC 139 Advanced Engine Performance	4
ATEC 140 Hybrid Vehicle Maintenance and Repair	2
Required Major Total Units	**45**
Solano General Education	**21**
Electives (as needed to reach 60 units)	**0**
Total Degree Units	**66**

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

Automotive

Automotive Automatic Transmissions and Transaxles

Program Description
This program is designed to prepare graduates for entry level employment in the automotive industry as an Automatic Transmission/Transaxle Service/Repair Technician.

Certificate of Achievement
A Certificate of Achievement in Automatic Transmissions and Transaxles can be obtained by completing the 17-unit automotive major. All courses must be completed with a minimum grade of C or a P if the course is taken on a Pass/No Pass basis.

Program Outcomes
Students who complete the Certificate of Achievement in Automatic Transmissions and Transaxles shall have demonstrated and practiced:

1. 85% of all Master Automobile Service Technology (MAST) P1, P2, and P3 (priority level) Automatic Transmission and Transaxle tasks in accordance with the 2013 National Automotive Technicians Education Foundation (NATEF) automotive training program accreditation standards for the Automatic Transmission and Transaxle Technician A2 Certification.

REQUIRED COURSES	**Units**
ATEC 070 Automotive Fundamentals	3
ATEC 131 Automotive Electrical Systems	4
ATEC 134 Automatic Transmissions/Transaxles	4
ATEC 138 Automotive Electronics	4
ATEC 140 Hybrid Vehicle Maintenance and Repair	2
Total Units	**17**

This is a Gainful Employment Program. For additional information, please visit ***http://www.solano.edu/gainful_employment/*** *and select "Automotive Automatic Transmissions and Transaxles."*

Automotive

Automotive Electrical and Body Systems

Program Description
This program is designed to prepare graduates for entry level employment in the automotive industry as an Automotive Electrical/Electronics Service/Repair Technician.

Certificate of Achievement
A Certificate of Achievement in Automotive Electrical and Body Systems can be obtained by completing the 17-unit automotive major. All courses must be completed with a minimum grade of C or a P if the course is taken on a Pass/No Pass basis.

Program Outcomes
Students who complete the Certificate of Achievement in Automotive Electrical and Body Systems shall have demonstrated and practiced:

1. 85% of all Master Automobile Service Technology (MAST) P1, P2, and P3 (priority level) Electrical/electronic Systems tasks in accordance with the 2013 National Automotive Technicians Education Foundation (NATEF) automotive training program accreditation standards for the Electrical/Electronic Technical A6 Certification.

REQUIRED COURSES	**Units**
ATEC 070 Automotive Fundamentals	3
ATEC 131 Automotive Electrical Systems	4
ATEC 137 Automotive Heating and Air Conditioning	4
ATEC 138 Automotive Electronics	4
ATEC 140 Hybrid Vehicle Maintenance and Repair	2
Total Units	**17**

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

Automotive

Automotive Maintenance and Light Repair

Program Description
This program is designed to prepare graduates for entry level employment in the automotive industry as apprentice technicians, lube technician, express service technician or parts specialist.

Certificate of Achievement
The Certificate of Achievement can be obtained by completing the 17-unit automotive major. All courses in the major must be completed with a minimum grade of C or a P if the course is taken on a pass-no pass basis.

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

1. Completion of 85 % of the tasks established by NATEF.
2. Proper preventative maintenance procedures of the following systems:
   - Engine Systems
   - Automatic Transaxles/Transmissions
   - Manual Drivetrain
   - Suspension and Steering
   - Brakes
   - Electrical Systems
   - Heating and Air Conditioning
   - Hybrid and Alternative Fuel Vehicles
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 Service and Repair.

REQUIRED COURSES	**Units**
ATEC 070 Automotive Fundamentals	3
ATEC 130 Automotive Suspension and Steering	4
ATEC 131 Automotive Electrical Systems	4
ATEC 132 Automotive Brake Systems	4
ATEC 140 Hybrid Vehicle Maintenance and Repair	2
Total Units	**17**

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

Automotive

ATEC 070 Automotive Fundamentals 3.0 Units

Course Advisory: SCC minimun English and Math standards.
Transferable to CSU
Hours: 32-36 lecture, 48-54 lab.

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.

ATEC 130 4.0 Units

Automotive Suspension and Steering

Prerequisite: ATEC 070 with a minimum grade of C (may enroll concurrently).
Course Advisory: ATEC 131
Hours: 32-36 lecture, 96-108 lab.

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.

ATEC 131 Automotive Electrical Systems 4.0 Units

Prerequisite: ATEC 070 with a minimum grade of C (may enroll concurrently).
Hours: 32-36 lecture, 96-108 lab.

Theory and principles of automotive electrical systems including 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. Laboratory will place emphasis on diagnosis and testing techniques required to effectively determine the necessary action in an electrical system failure. 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.

ATEC 132 Automotive Brake Systems 4.0 Units

Prerequisite: ATEC 070 with a minimum grade of C (may enroll concurrently).
Course Advisory: ATEC 131
Hours: 32-36 lecture, 96-108 lab.

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.

ATEC 133 Automotive Engine Repair 4.0 Units
Prerequisite: ATEC 070 with a minimum grade of C (may enroll concurrently).
Course Advisory: ATEC 131
Hours: 32-36 lecture, 96-108 lab.
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. Laboratory 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.

ATEC 134 4.0 Units
Automatic Transmissions/Transaxles
Prerequisite: ATEC 070 with a minimum grade of C (may enroll concurrently).
Course Advisory: ATEC 131
Hours: 32-36 lecture, 96-108 lab.
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. Laboratory 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.

ATEC 135 Automotive Engine Performance 4.0 Units
Prerequisite: ATEC 070 with a minimum grade of C (may enroll concurrently).
Course Advisory: ATEC 131
Hours: 32-36 lecture, 96-108 lab.
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. 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.

ATEC 136 4.0 Units
Automotive Manual Drivetrain and Axles
Prerequisite: ATEC 070 with a minimum grade of C (may enroll concurrently).
Hours: 32-36 lecture, 96-108 lab.
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.

ATEC 137 4.0 Units
Automotive Heating and Air Conditioning
Prerequisite: ATEC 070 with a minimum grade of C (may enroll concurrently).
Hours: 32-36 lecture, 96-108 lab.
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. Laboratory 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.

ATEC 138 Automotive Electronics 4.0 Units
Prerequisite: A minimum grade of C in ATEC 070 and ATEC 131.
Hours: 32-36 lecture, 96-108 lab.
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; 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.

ATEC 139 Advanced Engine Performance 4.0 Units

Prerequisite: A minimum grade of C in ATEC 070, ATEC 131 and ATEC 135.
Hours: 32-36 lecture, 96-108 lab.

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 (ASE) standards and is designed to prepare the student for the ASE A8 and L1 Engine Performance Certification Examination series.

ATEC 140 2.0 Units

Hybrid Vehicle Maintenance and Repair

Course Advisory: SCC minimum English and Math standards.
Hours: 16-18 lecture, 48-54 lab.

Study of hybrid vehicles, safety issues associated with hybrid vehicles, maintenance and repair procedures specific to hybrid vehicles.

ATEC 148A Special Topics-Smog Check Level I 2.5 Units

Hours: 32-36 lecture, 32-36 lab.

The Engine and Emission Control Training is intended to provide students with fundamental knowledge of engine and emission control theory, design and operation. Students who successfully complete this training will have met the first step of the Bureau of Automotive Repair's training requirements for inexperienced or minimally experienced candidates for the Smog Check Inspector license. The training is a minimum of 68 hours and must be completed at a Bureau of Automotive Repair (BAR) certified school. To pass Level 1 training, a student must successfully complete a series of hands-on assessments and pass a written examination. Experienced candidates may skip Level 1 training if they: Possess ASE A6, A8 and L1 certification; or possess an AA/AS Degree or Certificate in automotive technology and have 1 year experience; or have 2 years experience and have completed BAR specified diagnostic and repair training.

ATEC 148B 1.0 Unit

Special Topics - Smog Check Level II

Prerequisite: ATEC 148A with a minimum grade of C.
Hours: 16-18 lecture, 8-9 lab.

Level 2 - Smog Check Procedures Training. This training provides students the procedural knowledge, skills, and abilities needed to perform Smog Check inspections. This training is a minimum of 28 hours and must be completed at a BAR-certified school. The Smog Check Procedures Training must be completed by all Inspector candidates. To pass Level 2 training, a student must successfully complete a series of hands-on assessments and pass a written examination. Students who complete and pass this training will have met the Bureau's training requirements to qualify to take the Smog Check Inspector state licensing examination.