

# 94 Automotive Technology

## Definition

Automotive Technology is designed to provide the future and working technician with a strong foundation in automotive repair, including knowledge of and skills in the most up-to-date and advanced technology. The goal of the Automotive Technology program is to provide pre-employment instruction in the manipulative skills, technical knowledge, and related trade information which will prepare the student for employment in the automotive industry. Class offerings allow students with any experience level the opportunity to prepare for entry into the current automotive job market. Improvement and upgrading of technicians is another goal of the program.

## Staff

To access faculty and staff, dial (661) 722-6300, then the 4-digit extension.

### Program Advisement:

Margaret Drake, Dean ext. 6327

### Administrative Assistant:

Maureen Rethwisch ext. 6327

### Faculty:

Kevin Mawhorter ext. 6510

### Instructional Assistant:

Donald Jackson ext. 6539

Kenneth Miller ext. 6891

### Adjunct Faculty:

To access adjunct faculty voice mail, dial (661) 722-6300, then the 4-digit number.

	V.M.
Chuck Capsel	6539
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Leo McConnell	2144
John Mawhorter	2107
Bruce Shanks	2010

## Program Description

The Automotive Technology program is in a constant state of development and expansion into new technology. The two-year program is offered in four major sections: engine, electrical, fuel, and chassis. Normally the two-year vocational program may be taken during both day and evenings. Classes vary from entry level to advanced training in specialized topics.

Students must receive a minimum grade of "C" or better in all required core courses and the specific courses listed as

program electives in order to qualify for the degree or certificate.

## Distinctive Features

Students have direct access to specialized and up-to-date automotive repair equipment. They are able to run equipment and perform automotive repairs in the automotive shop. The program features both lecture and "hands-on" instruction, covers both domestic and imported vehicles, and emphasizes the latest in high-technology.

## Career Options

### Two-year application:

Entry-level training for automotive service outlets such as new car dealerships, independent garages, mass merchandisers, local, state and federal motor pools.

### Advanced specialization and upgrading:

California clean air car course, ASE A-6, A-8, and L-1 California equivalence courses, fuel injection, computer controls, automatic transmissions, air conditioning, and air conditioning certification.

## Certificate Programs

### Engine and Drive Trains

The following courses (26 units) are required for the certificate.

Required Courses:	units
AUTO 110, Automotive Engines <b>or</b>	
AUTO 111 and 112, Automotive Engine Rebuilding**	8-10
AUTO 125, Automotive Chassis <b>or</b>	
AUTO 126, Automotive Brakes and AUTO 127, Automotive Suspension, Steering and Alignment and AUTO 128, Automotive Power Trains**	10-13
AUTO 130, Basic Automatic Transmissions and Transaxles	4
Program Electives	4-6
	<b>Total 26</b>

For a recommended plan of study for the certificate, please refer to the Associate Degree plan minus the general education requirements.

Program Electives:	units
AUTO 105, Automotive Principles and Practices	4
AUTO 113, Automotive Engine Rebuilding (Advanced)	4
AUTO 151, Automotive Chassis and Body Electrical Systems	4
AUTO 190, Automotive Parts Specialist	6
AUTO 200, Automotive Air Conditioning	2
AUTO 231, Automatic Transmissions (General Motors)	2
AUTO 232, Automatic Transmissions (Ford and Chrysler)	2
WELD 101, Welding Fundamentals	2

\*\*These courses are intended for night students.

## Driveability, Emissions, and Electrical

The following courses (26 units) are required for the certificate.

Required Courses:	units
AUTO 150, Automotive Electrical Systems <b>or</b> AUTO 151, Automotive Chassis and Body Electrical Systems and AUTO 152, Automotive Ignition Systems and AUTO 153, Automotive Starting and Charging Systems**	8-10
AUTO 175, Automotive Fuel, Emission Systems, and Calif. Clean Air Car Course <b>or</b> AUTO 276, Calif. Clean Air Car Course and AUTO 176, Automotive Carburetor Fuel Systems and AUTO 177, Elect. Fuel Injection**	10-14
Program Electives	4-6
	<b>Total 26</b>

For a recommended plan of study for the certificate, please refer to the Associate Degree plan minus the general education requirements.

Program Electives:	units
AUTO 105, Automotive Principles and Practices	4
AUTO 190, Auto. Parts Specialist	6
AUTO 200, Automotive Air Conditioning	2
AUTO 277, Elect. Engine Controls-General Motors Systems	4
AUTO 278, Elect. Engine Controls-Ford/Chrysler Systems	4

WELD 101, Welding Fundamentals 2

\*\*These courses are intended for night students.

Antelope Valley College is not an Automotive Service Excellence General Auto Mechanic certification testing site. The following courses are suggested for students who are preparing to take the **\*Automotive Service Excellence General Auto Mechanic Certification (ASE) test:**

AUTO 110, Automotive Engines	10
AUTO 125, Automotive Chassis	10
AUTO 128, Auto. Power Trains	4
AUTO 150, Auto. Electrical Systems	10
AUTO 152, Auto. Ignition Systems	2
AUTO 175, Auto. Fuel, Emission Systems, and Calif. Clean Air Car Course	10
AUTO 200, Auto. Air Conditioning	2
AUTO 231, Automatic Transmissions (General Motors)	2
AUTO 232, Automatic Transmissions (Ford and Chrysler)	2

\*Two years experience as a mechanic are required for the ASE certificate. A two-year full-time college program will suffice for one year of experience.

### Associate Degree

The requirements for an associate degree in Automotive Technology may be satisfied by completing 26 units of required courses in any of the certificate programs, 21 units of general education requirements, and sufficient elective credits to total 60 units. (See Graduation/Associate Degree Requirements.)

Students who complete the associate degree will enhance their knowledge and skills needed to compete for employment in the automotive field. They will be better prepared and qualified for a full time position as an automotive technician as they gain valuable experience in the various disciplines. The associate degree will further enhance their opportunity for promotion into supervisory and management positions. The associate degree will help the student excel in the automotive field by broadening their thinking and communication skills needed along with their mechanical skills.

### Engine and Drive Trains

Except in cases of a prerequisite requirement, it is not required to take courses in exactly this sequence; they are recommended in this order to facilitate success.

#### Recommended Plan of Study

<b>First Semester</b>	<b>units</b>
AUTO 110, Automotive Engines or AUTO 111 and 112, Automotive Engine Rebuilding**	8-10
Course from GE requirement Area A	3
Course from GE requirement Area D1	3
<b>Total</b>	<b>14-16</b>

<b>Second Semester</b>	<b>units</b>
AUTO 125, Automotive Chassis or AUTO 126, Automotive Brakes and AUTO 127, Automotive Suspension, Steering and Alignment and AUTO 128, Automotive Power Trains**	8-10
Course from GE requirement Area B	3
Course from GE requirement Area D2	3
<b>Total</b>	<b>14-16</b>

<b>Third Semester</b>	<b>units</b>
AUTO 130, Basic Automatic Transmissions and Transaxles	4
Course from GE requirement Area E	3
Course from GE requirement Area F	3
Program Electives	2-6
Elective	3
<b>Total</b>	<b>15-19</b>

<b>Fourth Semester</b>	<b>units</b>
Course from GE requirement Area C	3
Electives	6-14
<b>Total</b>	<b>9-17</b>

**Degree Total 60**

#### Program Electives:

Please refer to the Program Electives listed under the certificate program.

\*\*Semester order for classes and time to complete may vary for night students.

### Driveability, Emissions, and Electrical

Except in cases of a prerequisite requirement, it is not required to take courses in exactly this sequence; they are recommended in this order to facilitate success.

#### Recommended Plan of Study

<b>First Semester</b>	<b>units</b>
AUTO 150, Automotive Electrical Systems or AUTO 151, Automotive Chassis and Body Electrical Systems and AUTO 152, Automotive Ignition Systems and AUTO 153, Automotive Starting and Charging Systems**	8-10
Course from GE requirement Area A	3
Course from GE requirement Area D1	3
<b>Total</b>	<b>14-16</b>

<b>Second Semester</b>	<b>units</b>
AUTO 175, Automotive Fuel, Emission Systems, and Calif. Clean Air Car Course or AUTO 276, Calif. Clean Air Car Course and AUTO 176, Automotive Carburetor Fuel Systems and AUTO 177, Elect. Fuel Injection**	10-14
Course from GE requirement Area D2	3
<b>Total</b>	<b>13-17</b>

<b>Third Semester</b>	<b>units</b>
Course from GE requirement Area E	3
Course from GE requirement Area F	3
Program Electives	4-6
Electives	6
<b>Total</b>	<b>16-18</b>

<b>Fourth Semester</b>	<b>units</b>
Course from GE requirement Area B	3
Course from GE requirement Area C	3
Electives	5-9
<b>Total</b>	<b>11-15</b>

**Degree Total 60**

#### Program Electives:

Please refer to the Program Electives listed under the certificate program.

\*\*Semester order for classes and time to complete may vary for night students.

### Transfer

Not a transfer major.

### Prerequisite Completion

If a course is listed as a prerequisite for another course, that prerequisite course must be completed with a satisfactory grade in order to enroll in the next course. According to Title 5, Section 55200(d), a satisfactory grade is a grade of "A," "B," "C" or "P". Classes in which the Pass/No

Pass option is available are indicated with an asterisk (\*) before the course title. See "Pass/No Pass Option" in the catalog for full explanation.

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## Automotive Technology Courses

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### AUTO 100 \*BASIC AUTOMOTIVE

2 units

2 hours weekly

**Advisory:** Eligibility for ENGL 099, READ 099 and MATH 070.

A basic course in automotive principles of operation designed for the entry-level person. **NOTE:** This class is lecture only on the basic operation of automotive systems. It is highly recommended that students desiring to learn proper maintenance and perform "live" work on their own cars take AUTO 101 concurrently. (AVC)

### AUTO 101 \*BASIC AUTOMOTIVE PRACTICUM

1 unit

3 hours weekly

**Advisory:** Completion of or concurrent enrollment in AUTO 100, and Eligibility for ENGL 099, READ 099 and MATH 070.

A basic "hands-on" course in automotive preventive maintenance and minor repair. Students must furnish own work clothes and safety glasses. (AVC)

### AUTO 102 \*BASIC AUTOMOTIVE PRACTICUM

1 unit

3 hours weekly

**Prerequisite:** Completion of AUTO 101.

**Advisory:** Completion of AUTO 100, and Eligibility for ENGL 099, READ 099 and MATH 070.

A course in automotive preventative servicing, and simple repairs. Students repeat some of the same operations as required in AUTO 101, this time with greater proficiency; as well as tackle additional repairs and service. Consult with the instructor for individual instruction on more complex jobs. (AVC)

### AUTO 105 \*AUTOMOTIVE PRINCIPLES AND PRACTICES

4 units

4 hours weekly

**Advisory:** Eligibility for ENGL 099, READ 099 and MATH 070.

First course for students desiring a career as an automotive technician. Covers core skills and knowledge of automotive systems and job-related practices. (AVC)

### AUTO 110 \*AUTOMOTIVE ENGINES

10 units

20 hours weekly

**Advisory:** Completion of AUTO 100, and Eligibility for ENGL 099, READ 099 and MATH 070.

A course in the fundamentals of automotive engine repair. Includes laboratory experience in modern techniques of engine diagnosis, overhaul, maintenance, and rebuilding. (AVC)

### AUTO 111 \*AUTOMOTIVE ENGINE REBUILDING (LOWER END)

4 units

8 hours weekly

**Advisory:** Completion of AUTO 100, and Eligibility for ENGL 099, READ 099 and MATH 070.

A course in the fundamentals of automotive engine repair and rebuilding includes laboratory experience in modern techniques of engine diagnosis, overhaul, maintenance and rebuilding. This class is the first in the sequence and deals primarily with the engine lower end/ short block and lubrication system. (AVC)

### AUTO 112 \*AUTOMOTIVE ENGINE REBUILDING (UPPER END)

4 units

8 hours weekly

**Advisory:** Completion of AUTO 100, and Eligibility for ENGL 099, READ 099 and MATH 070.

A course in the fundamentals of automotive engine repair and rebuilding primarily with cylinder head, cooling system, valve train, and related parts. Included is laboratory experience in modern techniques of engine diagnosis,

overhaul, maintenance, and rebuilding. (AVC)

### AUTO 113 \*AUTOMOTIVE ENGINE REBUILDING (ADVANCED)

4 units

8 hours weekly

**Prerequisite:** Completion of AUTO 110, or completion of both AUTO 111 and AUTO 112.

**Advisory:** Eligibility for ENGL 099, READ 099 and MATH 070.

A course in the repair and rebuilding of automotive engines. The student will already have completed AUTO 110 or completed both AUTO 111 and 112. The student will complete projects at his/her own rate. (AVC) (R3)

### AUTO 125 \*AUTOMOTIVE CHASSIS

10 units

20 hours weekly

**Advisory:** Completion of AUTO 100, and Eligibility for ENGL 099, READ 099 and MATH 070.

A course designed to help prepare students for a career in the automotive industry. Topics covered include fundamentals, maintenance, service, and repair of automotive braking systems, steering systems, suspension systems, wheel alignment, and manual power trains. Students who successfully complete the course are prepared for entry level job positions in the area of steering and suspension. Required course for Automotive Engine and Drive Train Certificate. (AVC)

### AUTO 126 \*AUTOMOTIVE BRAKES

4.5 units

6 hours weekly

**Advisory:** Completion of AUTO 100, and Eligibility for ENGL 099, READ 099 and MATH 070.

A course designed to help prepare students for a career in the automotive industry. Course will cover fundamentals, maintenance, service, and repair of automotive braking systems, both conventional and anti-lock brakes. Required course for Automotive Engine and Drive Train Certificate. (AVC)

### **AUTO 127 \*AUTOMOTIVE SUSPENSION, STEERING AND ALIGNMENT**

4.5 units

6 hours weekly

**Advisory:** Completion of AUTO 100, and Eligibility for ENGL 099, READ 099 and MATH 070.

A course designed for students preparing for a career in the automotive profession. Course will cover fundamentals, maintenance, service and repair of automobiles steering and suspension systems. Special emphasis will be placed on wheel alignment procedures. Required course for Automotive Engine and Drive Train Certificate. (AVC)

### **AUTO 128 \*AUTOMOTIVE POWER TRAINS**

4 units

72 hours total

**Advisory:** Completion of AUTO 100, and Eligibility for ENGL 099, READ 099 and MATH 070.

A course designed for students interested in a career in the automotive discipline. Course will cover fundamentals, maintenance, service and repair of manual transmissions, manual transaxles, drive shafts, constant velocity joints and rear differentials. Required course for Automotive Engine and Drive Train Certificate. (AVC)

### **AUTO 130 \*BASIC AUTOMATIC TRANSMISSIONS AND TRANSAXLES**

4 units

6 hours weekly

**Advisory:** Completion of AUTO 100, and Eligibility for ENGL 099, READ 099 and MATH 070.

A course designed to help prepare students for a career in the automotive industry. Course will cover fundamentals, maintenance, service, and repair of automotive automatic transmissions and transaxles. Required course for automotive certificate in automotive engines and drive trains. (AVC)

### **AUTO 150 \*AUTOMOTIVE ELECTRICAL SYSTEMS**

10 units

20 hours weekly

**Advisory:** Completion of AUTO 100 and AUTO 101, and Eligibility for ENGL 099, READ 099 and MATH 070.

Fundamentals, maintenance, diagnosis, repair, and service of starting, charging, ignition, lighting, safety, accessories and computer systems associated with automotive technology. (AVC)

### **AUTO 151 \*AUTOMOTIVE CHASSIS AND BODY ELECTRICAL SYSTEMS**

4 units

8 hours weekly

**Advisory:** Completion of AUTO 100, and Eligibility for ENGL 099, READ 099 and MATH 070.

A course in automotive electrical systems. Includes laboratory experiences in accessory circuitry, dash instruments, lighting, safety, and related control circuits. Emphasis is placed on the correct use of the ohmmeter, voltmeter, ammeter, digital storage oscilloscope, test light, jumperwire, wiring diagrams, and modern techniques of electrical diagnosis. (AVC)

### **AUTO 152 \*AUTOMOTIVE IGNITION SYSTEMS**

2 units

4 hours weekly

**Advisory:** Completion of AUTO 100, AUTO 101 and AUTO 151, and Eligibility for ENGL 099, READ 099 and MATH 070.

A course in automotive electrical tune-up, includes fundamentals of electricity, electronics, service, repair and adjustment of components dealing with various automotive starting and ignition systems. (AVC)

### **AUTO 153 \*AUTOMOTIVE STARTING AND CHARGING SYSTEMS**

2 units

4 hours weekly

**Advisory:** Completion of AUTO 100, AUTO 101 and AUTO 151, and Eligibility for ENGL 099, READ 099 and MATH 070.

This course is to familiarize the student with the principles of automotive starting and charging systems on an advanced level. Operation of the different electrical components, diagnosis and service are stressed. (AVC)

### **AUTO 175 \*AUTOMOTIVE FUEL, EMISSIONS SYSTEMS, AND CALIFORNIA CLEAN AIR CAR COURSE**

10 units

20 hours weekly

**Advisory:** Completion of AUTO 100, AUTO 101 and AUTO 150, and Eligibility for ENGL 099, READ 099 and MATH 070.

A course developed to prepare the automotive technician to diagnose and repair carburetor and electronic fuel injection, electronic engine control systems, emission systems, and pass the California Bureau of Automotive Repair Smog Check Mechanic Qualified Unlimited examination. (AVC)

### **AUTO 176 \*AUTOMOTIVE CARBURETOR FUEL SYSTEMS**

2 units

64 hours total

**Advisory:** Completion of AUTO 100, and Eligibility for ENGL 099, READ 099 and MATH 070.

A course in automotive carburetor fuel systems. Includes fundamentals in fuel delivery, internal and external carburetor adjustments on computer and non-computer controlled carburetors. (AVC)

### **AUTO 177 \*ELECTRONIC FUEL INJECTION**

4 units

72 hours total

**Advisory:** Completion of AUTO 100 and AUTO 151, and Eligibility for ENGL 099, READ 099 and MATH 070.

A course in understanding, diagnosis, and testing electronic fuel injection systems. This course will cover systems used on Chrysler, Ford, GM, and selected imports. (AVC)

**AUTO 190 \*AUTOMOTIVE PARTS SPECIALIST**

6 units

6 hours weekly

**Advisory:** Completion of AUTO 100 and AUTO 101, and Eligibility for READ 099 and MATH 060.

A course designed to familiarize students with the automotive aftermarket, especially the distribution and sale of automotive parts. Topics include workplace safety, automotive parts manufacturing and distribution structure, customer relations, inventory, marketing, parts identification, automotive systems and basic business math. After successful completion of the course students should be able to pass the ASE Automotive Parts Specialist exam. (AVC)

**AUTO 198 SEMINARS**

units vary

hours vary

**Advisory:** Eligibility for ENGL 099 and READ 099.

(**Note: Advisory for AUTO 198C is Eligibility for ENGL 099 and READ 099 and MATH 070.**)

Short courses of varying duration on specialized topics in automotive systems, operations, and repairs. (AVC)

**AUTO 199 \*OCCUPATIONAL WORK EXPERIENCE**

1-8 units

hours vary

**Prerequisite:** To participate in work experience, students must have a job or internship which is either paid or voluntary and have the approval of the supervisor and instructor supervising work experience in the specific subject area. **PRIOR TO ENROLLING**, students must attend a scheduled orientation or meet individually with the supervising instructor for an individual orientation.

Occupational Work Experience Education is supervised employment designed to provide students a realistic learning experience through work. The ultimate goal is to teach students those skills and attitudes that will equip them to function and adapt as an employee in a variety of situations and jobs. Occupational Work Experience Education is supervised employment extending classroom-based

occupational learning at an on-the-job learning station related to the students' educational major or occupational goal. Credit may be accrued at the rate of one to eight units per semester. For the satisfactory completion of all types of Cooperative Work Experience Education (WE 197 and WE 199), students may earn up to a total of sixteen semester credit hours. (CSU, AVC) (R3)

**AUTO 200 \*AUTOMOTIVE AIR CONDITIONING**

2 units

64 hours total

**Advisory:** Completion of AUTO 100 and AUTO 151, and Eligibility for ENGL 099, READ 099 and MATH 070.

Automotive air conditioning fundamentals, including theory, testing, and servicing factory conventional automatic temperature control, and "bolt-on" types of systems. Cooling electrical and vacuum systems as they relate to the automotive air conditioning systems are also covered. Section 609 certification for CFC-12 and HFC 134A is available. (AVC)

**AUTO 210 \*AUTOMOTIVE SPECIALIZATION LAB**

.5-6 units

1.5-20 hours weekly

**Prerequisite:** Completion of any of the following AUTO courses: 102, 110, 111, 112, 125, 126, 127, 128, 130, 150, 151, 152, 153, 175, 176, 177, 200, 231, 232, 276, 277 or 278.

**Advisory:** Eligibility for ENGL 099, READ 099 and MATH 070.

Class designed strictly for automotive work. Students enrolled in this class are expected to work in areas previously studied so as to gain additional experience in live shop operation. Students will work on jobs of their own choosing or jobs assigned by the instructor. Work will be performed to trade and industry standards. (AVC) (R3)

**AUTO 231 \*AUTOMATIC TRANSMISSIONS (GENERAL MOTORS)**

2 units

64 hours total

**Advisory:** Completion of AUTO 100, and Eligibility for ENGL 099, READ 099 and

MATH 070.

A course intended to prepare students for an entry level position in automatic transmission diagnosis and repair. Course will cover fundamentals, maintenance, service, and repair of late model General Motors transmissions and transaxles. Required course for automotive certificate in automotive engines and drive trains. (AVC)

**AUTO 232 \*AUTOMATIC TRANSMISSIONS (FORD AND CHRYSLER)**

2 units

64 hours total

**Advisory:** Completion of AUTO 100, and Eligibility for ENGL 099, READ 099 and MATH 070.

A course intended to prepare students for an entry level position in automatic transmission diagnosis and repair. Course will cover fundamentals, maintenance, service, and repair of late model Ford and Chrysler transmissions and transaxles. Required course for automotive certificate in automotive engines and drive trains. (AVC)

**AUTO 276 \*CALIFORNIA CLEAN AIR CAR COURSE**

8 units

140 hours total

**Advisory:** Completion of AUTO 150, AUTO 176 and AUTO 177, and Eligibility for ENGL 099, READ 099 and MATH 070.

Designed to prepare students and technicians wishing to become state of California licensed smog inspection technicians. Covers both the basic and advanced California Clean Air Car Courses. Both courses are needed to partially satisfy the education prerequisite required to become a licensed "Advanced Emission Specialist". Students wishing to take the exam must have one year of experience or education in the automotive engine performance area prior to taking the exam. Other interested parties are allowed to take the course, but will not be certified as eligible to take the state licensing examination given by the Bureau of Automotive Repair (BAR). (AVC)

**AUTO 277 \*ELECTRONIC  
ENGINE CONTROLS–  
GENERAL MOTORS  
SYSTEMS**

*4 units*

*72 hours total*

**Advisory:** Eligibility for ENGL 099,  
READ 099 and MATH 070.

A course designed for students preparing for a career in the automotive profession. Course will cover General Motors microprocessor controlled ignition and fuel systems. Subjects covered include microprocessor operation, sensors, actuators, and closed loop operation. Special emphasis will be placed on diagnosis and testing of electronic components. Students who successfully complete course are prepared for entry level job position in the area of engine performance. **BEFORE ENROLLING,** it is advised that students should have a background in engine performance and electrical systems. (AVC)

**AUTO 278 \*ELECTRONIC  
ENGINE CONTROLS–FORD/  
CHRYSLER SYSTEMS**

*4 units*

*72 hours total*

**Advisory:** Eligibility for ENGL 099,  
READ 099 and MATH 070.

A course designed for students preparing for a career in the automotive profession. Course will cover Ford and Chrysler microprocessor controlled ignition and fuel systems. Subjects covered include microprocessor operation, sensors, actuators, and closed loop operation. Special emphasis will be placed on diagnosis and testing of electronic components. Students who successfully complete course are prepared for entry level job position in the area of engine performance. **BEFORE ENROLLING,** it is advised that students should have a background in engine performance and electrical systems. (AVC)