

Automotive Service and Technology

Degrees and Certificates

Associate in Science Degree: Automotive Service and Technology

Certificate of Achievement: Automotive Service and Technology

Program Description

The automotive industry has long recognized the need for skilled, highly trained service technicians. The consumer movement has turned that need into a demand. Today's automobile is a sophisticated, complex machine which requires skilled technicians to keep it running smoothly.

Santa Barbara City College offers two programs in Automotive Service and Technology. It also offers updated auto skills, retraining and entry-level job courses, all offered for lifelong careers with good pay and working conditions and a chance to advance in the exciting high-tech automotive industry.

The Automotive program has been certified by the National Institute for Automotive Service Excellence (ASE) as a "Master" training institution, having met strict industry standards in all eight of the automotive specialty areas. The eight areas of ASE specialization are Engine Repair, Engine Performance, Heating and Air Conditioning, Electrical Systems, Automatic Transmissions, Manual Transmission and Axle, Brakes and Front End.

Program Student Learning Outcomes

Automotive Certificate of Achievement

1. Students will develop skills to advance their knowledge as automotive technicians.
2. Students will conduct themselves on the job as professionals, including practicing safety precautions to prevent accidents.
3. Students will become lifelong learners and advocates for the automotive industry.

Automotive Services and Technology Degree

1. Students will develop skills to advance their knowledge as automotive technicians.
2. Students will conduct themselves on the job as professionals, including practicing safety precautions to prevent accidents.
3. Students will become lifelong learners and advocates for the automotive industry.

Department Offices

Division: Technologies

Department Chair: David Brainerd (A-123, ext. 2220)

Faculty and Offices

Robert Stockero (A-178, ext. 2836)

David Brainerd (OE-180, ext. 2220)

Glenn Troub (A-123, ext. 2389)

Requirements for A.S. Degree: Automotive Service and Technology

The Associate Degree will be awarded upon completion of both department *and* college requirements

Department Requirements (43.2 units)

AUTO 101 — Introduction to Auto Mechanics.....	3
AUTO 110 — Fundamentals of Auto Servicing	3
AUTO 111 — Engine Rebuilding	7
AUTO 112 — Brakes, Suspension and Steering.....	4.6
AUTO 113 — Auto Fuel and Air Conditioning Systems	4.6
AUTO 114 — Automotive Power Train	7
AUTO 115 — Automotive Electricity	7
AUTO 116 — Engine Performance	7

Recommended Electives:

AUTO 102 — Basic Car Care, Maintenance and Repair	3
AUTO 205 — OBD2/Basic Clean Air Course	1.2
AUTO 207 — Smog Check Technician Update.....	1
AUTO 217 — Automotive Specialty I.....	2
AUTO 218 — Automotive Specialty II.....	3

AUTO 219/CNEE 219 — Adv Auto Electronics	4
AUTO 220 — Emission Controls/ Basic Clean Air Car Course	3
AUTO 290 — Work Experience	2-4

Complete each required course with a minimum grade of "C".

College Requirements

For complete information, see "Graduation Requirements" in the *Catalog* Index.

Sample Program of Study: A.S. Degree (Two Years)

<i>First Semester</i>	<i>Units</i>
AUTO 101 — Introduction to Auto Mechanics	3
AUTO 111 — Engine Rebuilding	7
*MATH 100 or higher	4
*ENG 110/120 — Composition and Reading <i>or</i> *ENG 110H — Composition and Reading, Honors	4
Total.....	18
<i>Second Semester</i>	<i>Units</i>
AUTO 110 — Fundamentals of Auto Servicing	3
AUTO 114 — Auto Power Train (Fall Semester) <i>or</i> AUTO 115 — Auto Electricity (Spring Semester)	7
*Lab Science	4
*Oral Communication	3
*Physical Education	1
Total.....	18
<i>Third Semester</i>	<i>Units</i>
AUTO 113 — Auto Fuel and Air Cond Systems (Fall) <i>or</i> AUTO 112 — Brakes/Suspension/Steering (Spring)	4.6
AUTO 116 — Engine Performance	7
*History or Political Science	3
*Physical Education	1
** AUTO 220 — Emission Controls/Basic Clean Air Car Course	3
Total.....	15.6-18.6

<i>Fourth Semester</i>	<i>Units</i>
<i>Take course(s) not yet completed:</i>	
AUTO 113 — Auto Fuel and Air Cond. Systems (Fall) <i>or</i> AUTO 112 — Brakes, Suspension and Steering (Spring)	4.6
AUTO 114 — Auto Power Train (Fall) <i>or</i> AUTO 115 — Auto Electricity (Spring)	7
*Humanities/Multicultural	3
<i>Take one of the following:</i>	
** AUTO 220 — Emission Control/ Basic Clean Air Car Course	3
**AUTO 219 — Adv. Auto Electronics	4
**AUTO 217 <i>or</i> 218 — Auto Specialty I <i>or</i> II	2-3
**AUTO 290 — Work Experience	2-4
Total.....	14-18.6

**General Ed. Requirements: See this Catalog for complete course listings.*

***Recommended but not required for either Certificate of Achievement or A.S. Degree.*

**Requirements for Certificate of Achievement:
Automotive Service and Technology**

Department Requirements (43.2 units)

AUTO 101 — Introduction to Auto Mechanics	3
AUTO 110 — Fundamentals of Auto Servicing	3
AUTO 111 — Engine Rebuilding	7
AUTO 112 — Brakes, Suspension and Steering	4.6
AUTO 113 — Auto Fuel and Air Conditioning Systems	4.6
AUTO 114 — Automotive Power Train	7
AUTO 115 — Automotive Electricity	7
AUTO 116 — Engine Performance	7
<i>Recommended Electives:</i>	
AUTO 102 — Basic Car Care, Maintenance and Repair	3
AUTO 205 — OBD2/Basic Clean Air Car Course	1.2
AUTO 207 — Smog Check Technician Update	1
AUTO 217 — Automotive Specialty I	2
AUTO 218 — Automotive Specialty II	3
AUTO 219/CNEE 219 — Advanced Auto Electronics	4

AUTO 220 — Emission Controls/Basic Clean Air Car Course..3
 AUTO 290 — Work Experience..... 2-4
 Complete each required course with a minimum grade of “C”.

Sample Program of Study: Certificate (One Year)

<i>First Semester</i>	<i>Units</i>
AUTO 101 — Introduction to Auto Mechanics.....	3
AUTO 110 — Fund of Auto Servicing.....	3
AUTO 111 — Engine Rebuilding	7
AUTO 113 — Auto Fuel and Air Cond Systems or AUTO 112 — Brakes, Suspension and Steering.....	4.6
Total.....	17.6

<i>Second Semester</i>	<i>Units</i>
AUTO 114 — Auto Power Train (Fall Semester) or AUTO 115 — Auto Electricity (Spring Semester)	7
AUTO 116 — Engine Performance	7
<i>The following course is recommended (not required):</i>	
AUTO 290 — Work Experience.....	2-4
Total.....	14-18

<i>Third Semester</i>	<i>Units</i>
Take course(s) not yet completed:	
AUTO 113 — Fuel Mgmt and Air Cond Systems or AUTO 112 — Brakes, Suspension and Steering.....	4.6
AUTO 114 — Auto Power Train (fall semester) or	7
AUTO 115 — Auto Electricity.....	4
<i>The following courses are recommended (not required):</i>	
AUTO 217 — Auto Specialty I or	2
AUTO 218 — Auto Specialty II	3
AUTO 290 — Work Experience.....	2-4
Total.....	11.6-18.6

Course Descriptions

AUTO 101 — Introduction to Auto Mechanics (3) — CSU

Skills Advisories: Eligibility for ENG 103
Hours: 54 lecture

Lecture/demonstration course introducing the operation and maintenance of the modern automobile;

emphasis on the theory of basic operating systems, including engine, electrical, chassis and driveline.

AUTO 102 — Basic Car Care, Maintenance and Repair (3) — CSU

Skills Advisories: Eligibility for ENG 103
Hours: 90 (36 lecture, 54 lab)

Introductory study and practice in basic car care, maintenance and repair. Students gain laboratory experience, performing service and minor repairs.

AUTO 110 — Fundamentals of Automotive Servicing (3) — CSU

Skills Advisories: Eligibility for ENG 100 and ENG 103
Course Advisories: AUTO 101, concurrently
Hours: 90 (36 lecture, 54 lab)

Introductory lecture/lab course covering maintenance and diagnosis procedures used in the automotive service industry. Lab experiences in maintenance and service areas of engine lubrication, underhood, undercar, tire and wheel, cooling system, belts and hoses, fuel system, battery and electrical system, engine maintenance and performance, brakes and wheel bearings.

AUTO 111 — Engine Rebuilding (7) — CSU

Skills Advisories: Eligibility for ENG 103
Course Advisories: AUTO 101 and AUTO 110
Hours: 216 (81 lecture, 135 lab)

Lecture/lab course on generic theory and repair of automotive engines. The valve train and lower end assemblies are covered in detail. Engine problem diagnosis, service and repair, engine rebuilding and machining, and performance enhancement emphasized.

AUTO 112 — Brakes, Suspension and Steering (4.6) — CSU

Skills Advisories: Eligibility for ENG 103
Course Advisories: AUTO 101 and AUTO 110
Hours: 144 (54 lecture, 90 lab)

Principles of brakes, suspension and steering systems, including wheel alignment and tire service. Includes disc and drum brakes, brake power assist units,

anti-lock braking, tire repair, wheel balancing, steering systems, two and four wheel alignment, and all related suspension systems. Live vehicle laboratory study of lecture material. NATEF-certified course.

AUTO 113 — Automotive Fuel and Air Conditioning Systems
(4.6) — CSU

Skills Advisories: Eligibility for ENG 103

Course Advisories: AUTO 101 and AUTO 110

Hours: 144 (54 lecture, 90 lab)

Principles of automotive fuel supply systems, carburetion, fuel injection heating, ventilation and air conditioning (HVAC) systems. Live vehicle repair in lab. NATEF-certified course.

AUTO 114 — Automotive Power Train
(7) — CSU

Skills Advisories: Eligibility for ENG 103

Course Advisories: AUTO 101 and AUTO 110

Hours: 216 (81 lecture, 135 lab)

Principles of the automotive power train, including the clutch, standard and automatic transmissions and transaxles, C/V joints, drive shafts and differentials. NATEF-certified course.

AUTO 115 — Automotive Electricity
(7) — CSU

Skills Advisories: Eligibility for ENG 103

Course Advisories: AUTO 101 and AUTO 110

Hours: 216 (81 lecture, 135 lab)

Study of the complete automotive electrical system, including theory, the battery, starting system, charging system, wiring, lighting and body electrical systems. Theory of operation covered in lecture; testing, diagnosis and repair applied in lab. NATEF-certified course.

AUTO 116 — Engine Performance
(7) — CSU

Skills Advisories: Eligibility for ENG 103

Course Advisories: AUTO 101 and AUTO 110

Hours: 216 (81 lecture, 135 lab)

Principles of engine performance diagnosis and maintenance, including compression, ignition and emission controls. Drivability, state-acceptable emission limits and fuel economy concerns also addressed.

AUTO 205 — OBD2/Basic Clean Air Car Course
(1.2)

Hours: 22 lecture

Understanding second-generation on-board diagnostics and use of OBD2-compliant scan tools. Course fulfills the BAR update training requirement for emission technicians. (*AUTO 220 is also required and can be taken concurrently.*)

AUTO 207 — Smog Check Technician Update
(1.0)

Hours: 18 lecture

The California Bureau of Auto Repair requires this course for anyone applying for an EA or EB smog check license. It is also required by the BAR as update training for anyone interested in renewing a smog check license.

AUTO 217 — Automotive Specialty I
(2)

Prerequisites: AUTO 112 or AUTO 113 or AUTO 114 or AUTO 115

Skills Advisories: Eligibility for ENG 100

Hours: 108 lab

Designed to further increase the skill and knowledge of the student in the ASE (Automotive Service Excellence) specialty area(s) of choice, working to trade standards. The eight areas of ASE specialization are Engine Repair, Engine Performance, Heating and Air Conditioning, Electrical Systems, Automatic Transmissions, Manual Transmission and Axle, Brakes and Front End.

AUTO 218 — Automotive Specialty II
(3)

Prerequisites: AUTO 111 or AUTO 116

Skills Advisories: Eligibility for ENG 100

Hours: 162 lab

Designed to further increase the skill and knowledge of the student in the ASE (Automotive Service Excellence) specialty area(s) of choice, working to trade standards. The eight areas of ASE specialization are Engine Repair, Engine Performance, Heating and Air Conditioning, Electrical Systems, Automatic Transmissions, Manual Transmission and Axle, Brakes and Front End.

**AUTO 219/CNEE 219 —
Advanced Automotive Electronics**

(4) — CSU

Skills Advisories: Eligibility for ENG 100 and ENG 103

Hours: 72 lecture

Provides basic theory and practice of automotive electronic system operation and trouble-shooting. Covers the basic building blocks of circuits and digital systems. Focus is on semiconductors and computer systems as applied to engine control.

**AUTO 220 — Emission Controls/
Basic Clean Air Car Course**

(3) — CSU

Skills Advisories: Eligibility for ENG 103

Hours: 54 lecture

Emission control operation and diagnosis. Includes preparation for California State certification exam. Fulfills part of the Bureau of Auto Repair Basic Area Technician license requirement. (*AUTO 205 is also required and can be taken concurrently.*)

**AUTO 221 — Principles of
Hybrid and Electric Drives**

(2) — CSU

Hours: 36 lecture

Study of hybrid, plug-in hybrid and electric vehicle powertrains. Topics include high-voltage battery packs, inverters and motor-generators. Includes hands-on exercises using a second-generation Toyota Prius in a lab setting. Suitable for anyone interested in advanced automotive technology.

**AUTO 225 — Advanced Clean Air
Course Update 1**

(0.5)

Hours: 9 lecture

Designed to instruct vehicle-loaded mode testing with the use of BAR 97 equipment. Five-gas analysis, catalytic converter testing, and diagnostic procedures are presented. (*Fulfills BAR 8-hour transition course requirement.*)

**AUTO 235 — Advanced Clean Air
Course Update 2**

(1.2)

Hours: 23.4 lecture

Satisfies Bureau of Auto Repair requirement to become licensed as an "Advanced Emission Specialist" smog inspector technician. Includes NOx emission diagnosis, digital oscilloscope, oxygen sensor waveform analysis, catalytic converter testing, and vehicle emissions testing procedures for the Enhanced Area program.

**AUTO 290 —Work Experience in
Automotive Service and Technology**

(2-4)

Skills Advisories: Eligibility for ENG 100 and ENG 103

Hours: 120-300 lab

Supervised automotive employment for students whose career objectives, automotive course studies and employment complement each other. The student must be employed in an occupation directly related to the Automotive major. Must also be enrolled in no less than seven (7) units, including Work Experience.