

**Degree:** A.S. - Automotive Analysis  
 A.S. - Automotive Collision Technology  
 A.S. - Automotive Component Service Technician  
 A.S. - Automotive Technology  
 A.S. - Diesel Mechanics

**Certificates:** Automotive Analysis  
 Automotive Claims Estimator  
 Automotive Collision Technology  
 Automotive Component Service Technician  
 Automotive Service Technician  
 Automotive Technology  
 Diesel Mechanics  
 Transmission Service

**Certificates of Completion offered by the department:**  
 Air Conditioning Service  
 Parts and Service  
 Undercar Service

**Area:** Technical Education  
**Dean:** Gabriel Meehan  
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[www.patc.biz](http://www.patc.biz)



The automotive technology program is a combination of classroom and hands-on shop experiences that prepare students for careers in all phases of automotive service and repair on all types of cars. Students are trained on the use of workshop manuals in traditional and computerized formats, hand held meters and scanners, and special shop tools including power and hand tools.

Highlights include:

- Chosen as a T-TEN facility
- NATEF certified in: brakes, electrical/electronic systems, engine performance, suspension and steering, automatic transmission/transaxle, engine repair, heating and air conditioning, manual drive trains and axles.
- ASE certified instructors and programs.
- Students may begin 6-week courses 3 times during the semester.
- 6-week courses allow completion of some certificate programs in one semester.
- Small class size ensures individual attention and access to specialized equipment.
- Preparation for ASE and State Smog Certification (Emissions Control) exams.

### T-TEN Program

American River College (in partnership with Toyota Motor Sales) offers a dealership technician training program known as the Toyota Technical Education Network (T-TEN). Toyota technology is folded into automotive classes as students learn on state-of-the-art Toyota vehicles. Students work in a dealership while attending school, receive tool scholarships, and earn advanced standing in Toyota's Master Technician Certification. T-TEN students need to take the following classes in order to receive Toyota Motor Sales industry certification: AT 100, 105, 106, 110, 130, 180, 310, 311, 312, 313, 314, and 322 or 320. Paid work experience is a requirement for each semester enrolled as an ARC T-TEN student (AT 298 for 8.5 units - 640 hours). For more information contact the T-TEN Coordinator, Mike Sipes, at (916) 484-8354.

## Automotive Analysis Degree and Certificate

This Automotive degree and certificate prepares the student for entry level employment as a smog and driveability service technician. The certificate also prepares the student for Automotive Service Excellence (ASE) certification in Engine Repair A1, Automatic Transmissions/Transaxles A2, Electrical A6, Engine Performance A8, Advanced Engine Performance L1 along with the California Enhanced Area (EA) Smog Check License.

### Career Opportunities

Automotive Technician; Smog Check Technician

Requirements for Degree Major or Certificate		47 units
<b>1st Semester</b>		
AT 100	Technical Basics for the Automotive Professional	2
AT 105	Mathematics for Automotive Technology	3
AT 180	Automotive Data Acquisition	3
<b>2nd Semester</b>		
AT 110	Automotive Brakes	4
AT 311	Suspension and Steering Systems	4
AT 312	Electrical Systems	4
<b>3rd Semester</b>		
AT 130	Manual Drive Trains and Axles	4
AT 314	Automotive Engine Repair	4
AT 313	Automatic Transmission and Transaxles	4
<b>4th Semester</b>		
AT 310	Heating and Air-Conditioning Systems	4
AT 322	Electronic Engine Controls/Engine Performance	5
<b>Final Semester</b>		
AT 323	Basic Area Clean Air Car Course	4
AT 324	Enhanced Area Clean Air Car	2

**Associate Degree Requirements:** The Automotive Analysis Associate in Science (A.S.) Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.

# Automotive Technology

## Automotive Collision Technology Degree and Certificate

### Requirements for Degree Major or Certificate 25.5 units

AT 121	Automotive Collision - Removal and Replacement of Non-Structural Components and Damage Analysis	2.5
AT 122	Automotive Collision - Non-Structural Repairs	2.5
AT 123	Automotive Collision - Structural Panel & Component Repairs	2.5
AT 124	Automotive Refinishing Technology	2.5
AT 126	Automotive Collision Estimating	2
AT 310	Heating and Air-Conditioning Systems	4
AT 311	Suspension and Steering Systems	4
AT 312	Electrical Systems	4
WELD 103	Gas Metal Arc Welding of Sheet Steel	1.5

**Associate Degree Requirements:** The Automotive Collision Technology Associate in Science (A.S.) Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.

## Automotive Component Service Technician Degree and Certificate

This degree or certificate prepares the student for employment repairing of various automobile components including those requiring computer technology.

### Career Opportunities

Employment as a technician, shop foreman, service manager for new car dealers, automotive repair shops, fleet operators.

### Requirements for Degree Major or Certificate 40 units

AT 100	Technical Basics for the Automotive Professional	2
AT 105	Mathematics for Automotive Technology	3
AT 110	Automotive Brakes	4
AT 130	Manual Drive Trains and Axles	4
AT 140	Advanced Automotive Skill and Speed Development	4
AT 180	Automotive Data Acquisition	3
AT 310	Heating and Air-Conditioning Systems	4
AT 311	Suspension and Steering Systems	4
AT 312	Electrical Systems	4
AT 313	Automatic Transmission and Transaxles	4
AT 314	Automotive Engine Repair	4

**Associate Degree Requirements:** The Automotive Component Service Technician Associate in Science (A.S.) Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.

## Automotive Technology Degree and Certificate

This program prepares the student for an entry level position in the automotive industry with emphasis on engine management systems, emission controls, and complete automotive systems diagnosis and repair. The program also prepares the student for all 9 Automotive Service Excellence (ASE) certifications including Advanced Engine Performance (L-1) as well as the state Enhanced Area (EA) Smog Certification Test.

### Requirements for Degree Major or Certificate 60 units

AT 100	Technical Basics for the Automotive Professional	2
AT 105	Mathematics for Automotive Technology	3
AT 110	Automotive Brakes	4
AT 130	Manual Drive Trains and Axles	4

AT 180	Automotive Data Acquisition	3
AT 310	Heating and Air-Conditioning Systems	4
AT 311	Suspension and Steering Systems	4
AT 312	Electrical Systems	4
AT 313	Automatic Transmission and Transaxles	4
AT 314	Automotive Engine Repair	4
AT 320	Engine Performance Technology	12
AT 321	Engine Performance Technology	12

**Associate Degree Requirements:** The Automotive Technology Associate in Science (A.S.) Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.

## Diesel Mechanics Degree and Certificate

### Requirements for Degree Major or Certificate 54 units

AT 105	Mathematics for Automotive Technology	3
AT 110	Automotive Brakes	4
AT 130	Manual Drive Trains and Axles	4
AT 150	Diesel Technology	10
AT 151	Diesel Technology	10
AT 310	Heating and Air-Conditioning Systems	4
AT 311	Suspension and Steering Systems	4
AT 312	Electrical Systems	4
AT 313	Automatic Transmission and Transaxles	4
AT 314	Automotive Engine Repair	4
WELD 300	Introduction to Welding	3

**Associate Degree Requirements:** The Diesel Mechanics Associate in Science (A.S.) Degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See ARC graduation requirements.

## Air Conditioning Service Certificate

This certificate program prepares the student for an entry level position in the automotive industry. This program also prepares the student for Automotive Service Excellence (ASE) certification in Air Conditioning A-7.

### Requirements for Certificate 16 Units

AT 100	Technical Basics for the Automotive Professional	2
AT 105	Mathematics for Automotive Technology	3
AT 180	Automotive Data Acquisition	3
AT 310	Heating and Air-Conditioning Systems	4
AT 312	Electrical Systems	4

## Automotive Claims Estimator Certificate

### Requirements for Certificate 21 Units

AT 100	Technical Basics for the Automotive Professional	2
AT 105	Mathematics for Automotive Technology	3
AT 126	Automotive Collision Estimating	2
AT 127	Automotive Collision Estimating II	2
AT 310	Heating and Air-Conditioning Systems	4
AT 311	Suspension and Steering Systems	4
BUS 212	Marketing for Small Businesses	1
BUS 218	Management Skills for the Small Business	1
BUS 224	Customer Service I	1
<i>And a minimum of 1 unit from the following:</i>		1
BUSTEC 300	Beginning Keyboarding/Applications (1 - 3)	

## Automotive Service Technician Certificate

This certificate prepares the student for an entry-level position in the automotive industry. It also prepares the student for Automotive Service Excellence (ASE) certifications in Automotive Brakes, Manual Drive Trains and Axles, Heating and Air-Conditioning Systems, Suspension and Steering Systems, Electrical Systems, Automatic Transmission and Transaxles, and Automotive Engine Repair.

### Career Opportunities

The Automotive Service Technician certificate prepares the student for entry level-positions in the fields of Auto Technician, Auto/Truck Specialist, Field Service, Sales Representative, Tune-up and Electrical Specialist.

Requirements for Certificate		36 units
AT 100	Technical Basics for the Automotive Professional	2
AT 105	Mathematics for Automotive Technology	3
AT 110	Automotive Brakes	4
AT 130	Manual Drive Trains and Axles	4
AT 180	Automotive Data Acquisition	3
AT 310	Heating and Air-Conditioning Systems	4
AT 311	Suspension and Steering Systems	4
AT 312	Electrical Systems	4
AT 313	Automatic Transmission and Transaxles	4
AT 314	Automotive Engine Repair	4

## Parts and Service Certificate

This certificate provides training for automotive parts and service advisors. Topics include parts knowledge, integrated computer management software, scheduling, inventory control, hazardous materials and warranty documentation requirements.

### Career Opportunities

Various positions in the automotive parts and service industry, such as service advisors and parts managers.

Requirements for Certificate		17 units
AT 100	Technical Basics for the Automotive Professional	2
AT 105	Mathematics for Automotive Technology	3
AT 107	Employability Skills for Technical Careers	2
AT 143	Automotive Parts and Service Advising	3
AT 180	Automotive Data Acquisition	3
BUS 100	English for the Professional	3
<i>And a minimum of 1 unit from the following:</i>		1
AT 298	Work Experience in Automotive Technology (1 - 4)	

## Transmission Service Certificate

This certificate program prepares the student for an entry-level position in the automotive industry. This program includes Automotive Service Excellence (ASE) certification in A-2 automatic transmission and A-3 manual drive-train.

### Career Opportunities

Entry-level positions in automatic transmission, clutch, and drive-train repair.

Requirements for Certificate		28 units
AT 100	Technical Basics for the Automotive Professional	2
AT 105	Mathematics for Automotive Technology	3
AT 130	Manual Drive Trains and Axles	4
AT 140	Advanced Automotive Skill and Speed Development	4
AT 180	Automotive Data Acquisition	3
AT 210	Advanced Automatic Transmission and Transaxle	4
AT 312	Electrical Systems	4
AT 313	Automatic Transmission and Transaxles	4

## Undercar Service Certificate

The Undercar Service certificate provides entry-level training to perform repairs in automotive suspension, brake and exhaust service facilities.

### Career Opportunities

This certificate provides students with knowledge for entry-level careers in the automotive suspension, brake and exhaust repair facilities.

Requirements for Certificate:		17 units
AT 100	Technical Basics for the Automotive Professional	2
AT 110	Automotive Brakes	4
AT 145	Automotive Exhaust System	4
AT 180	Automotive Data Acquisition	3
AT 311	Suspension and Steering Systems	4

### AT 10 General Automotive Maintenance 2 Units

*Prerequisite: None*

*Hours: 18 hours LEC; 54 hours LAB*

Familiarization with hand tools, safety and the proper maintenance procedures for today's high tech automobiles. Topics covered are oil changing, belt replacement and tension, hose replacement, fluid level checks, brake inspection, tire changing, jump starting, minor tune-up, and emergency road repair operations.

### AT 100 Technical Basics for the Automotive Professional 2 Units

*Formerly: AT 53*

*Prerequisite: None*

*Hours: 18 hours LEC; 54 hours LAB*

This course presents theoretical and practical training for entry-level technicians. It is a guide through basic automotive diagnosis and service procedures used in automotive shops. Lab projects performed in an automotive shop environment provide hands-on experience with industry shop tools. Shop service operations which meet Automotive Service Excellence (ASE) standards including safety, electrical, and other general automotive procedures are covered.

### AT 102 Keep Your Wheels Rolling 2 Units

*Formerly: AT 52*

*Prerequisite: None*

*Hours: 27 hours LEC; 27 hours LAB*

This course is designed to provide skills necessary for basic automotive upkeep. Additionally, it covers the selection of repair technicians and the purchase of vehicles. It is not designed for the automotive technician program.

## **AT 105 Mathematics for Automotive Technology 3 Units**

*Formerly: AT 75*

*Prerequisite: None*

*Hours: 54 hours LEC*

This course covers mathematics as it relates to the automotive trades. Metric system, fractions, decimal equivalents, basic equations, ratio and proportion, gear and pulley ratios, power, efficiency, torque and thrust are covered. AA/AS area 3D and 4C.

## **AT 106 Automotive Dealership Operations 2 Units**

*Prerequisite: None*

*Hours: 36 hours LEC*

This course is an introduction to dealership operations and includes all of the various influences on the technician's position within the operation. Topics include service, sales, parts, and financial departments' positions and operations. Customer satisfaction indexes and the Bureau of Automotive Repair (BAR) are discussed. Field trips to local dealerships may be required.

## **AT 107 Employability Skills for Technical Career 2 Units**

*Formerly: AT 118*

*Same As: ET 250 and WELD 150.*

*Prerequisite: None*

*Hours: 36 hours LEC*

This course provides the opportunity of exploring technical careers while developing valuable work and life skills. It is an introduction to a variety of technically related occupations. Emphasis is placed on exploring technical careers in the Sacramento area. Activities are designed to enhance personal development, employability skills, and self esteem through leadership, citizenship, and character development. Not open to students who have taken ET 250 or WELD 150. AA/AS area 3E

## **AT 110 Automotive Brakes 4 Units**

*Formerly: AT 57*

*Prerequisite: None*

*Corequisite: AT 100.*

*Hours: 36 hours LEC; 108 hours LAB*

This course covers theory, design, adjustment and repair or overhaul of brake systems and components. Operation of power and hand devices used in the servicing of brake systems and components is covered. This course meets ASE (Automotive Service Excellence) standards.

## **AT 121 Automotive Collision - Removal and Replacement of Non-Structural Components and Damage Analysis 2.5 Units**

*Prerequisite: None*

*Hours: 27 hours LEC; 54 hours LAB*

This course covers the principles and theory of automobile construction and application of technical skills. It provides a fundamental knowledge to correctly and safely remove, inspect, replace and align cosmetic bolt-on body components and assemblies on today's vehicles. This course provides information necessary for the technician to protect mechanical and electrical systems during tear down and reassembly, anchoring theory and techniques applicable to collision-damaged vehicles. Interpretation of damage analysis reports and types of collision damage are covered. Au

## **AT 122 Automotive Collision - Non-Structural Repairs 2.5 Units**

*Prerequisite: None*

*Hours: 27 hours LEC; 54 hours LAB*

This course provides the technical information and hands-on experience to perform limited and supervised repairs to collision-damaged vehicles. Principles and theory of automobile collision repair including procedures for replacement of door skins and quarter panels, metal straightening theory and techniques for both steel and aluminum, and making repair versus replacement decisions are covered. Measuring systems and techniques and their use in diagnosing and correcting collision damage are also presented.

## **AT 123 Automotive Collision - Structural Panel and Component Repairs 2.5 Units**

*Prerequisite: None*

*Hours: 27 hours LEC; 54 hours LAB*

This course provides the technical information and hands-on experience to perform limited and supervised repairs to collision-damaged vehicles. Principles and theory of automobile collision repair including procedures for replacement of door skins and quarter panels, metal straightening theory and techniques for both steel and aluminum, and making repair versus replacement decisions are covered. Measuring systems and techniques and their use in diagnosing and correcting collision damage are also presented.

## **AT 124 Automotive Refinishing Technology 2.5 Units**

*Prerequisite: None*

*Hours: 27 hours LEC; 54 hours LAB*

This course covers the principles and theory of paint finish application, tinting and blending, color evaluation, color adjustment and evaluating color mismatch problems. It also covers OSHA, EPA, Clean Air Act, and VOC regulations and compliance for each of these rules or regulations. Paint application techniques, restoration of corrosion protection, and blending procedures are covered in addition to new and emerging paint technologies. Color identification and interpreting vehicle color codes are covered.

## **AT 126 Automotive Collision Estimating 2 Units**

*Prerequisite: None*

*Hours: 18 hours LEC; 54 hours LAB*

This course is designed to provide the student with both technical and practical skills necessary to properly diagnose collision damaged vehicles and to document the costs and times necessary to repair collision damaged vehicles. Using state-of-the-art computer-generated estimating programs and video imaging, the student will analyze collision-damaged vehicles and then prepare itemized estimates detailing the required procedures and parts necessary to correctly repair the vehicle.

## **AT 127 Automotive Collision Estimating II 2 Units**

*Prerequisite: AT 126 with a grade of "C" or better.*

*Hours: 18 hours LEC; 54 hours LAB*

This course is a comprehensive study of computer-assisted estimating and office management systems used in the automotive collision repair industry. It includes a thorough study of all aspects of an estimator working in a collision repair facility environment. Advanced collision estimating concepts are presented.

## **AT 128 Automotive Collision Repair Welding 4 Units**

*Prerequisite: None*

*Hours: 36 hours LEC; 108 hours LAB*

This course includes principles and theory of welding applicable to collision repair. Emphasis will be on: welding thin gauge high strength low alloy and high strength steels found on today's vehicles; joint design for sectioning structural panels; weld testing; maintaining corrosion protection; equipment setup and tuning; and preparation for industry certification.

**AT 130 Manual Drive Trains and Axles 4 Units**

*Prerequisite: None*

*Corequisite: AT 100.*

*Hours: 36 hours LEC; 108 hours LAB*

This course covers the basics of manual transmission and transaxles principles of service and repair. Areas of instruction include clutches; manual transmissions and transaxles; drive line and shafts; differentials/limited slip differentials; and four-wheel drive/all-wheel drive. This course meets ASE (Automotive Service Excellence) standards.

**AT 140 Advanced Automotive Skill and Speed Development 4 Units**

*Prerequisite: None*

*Corequisite: AT 110, 130, 311, 312, and 314.*

*Hours: 36 hours LEC; 108 hours LAB*

This course covers automotive heavy component diagnosis and repair including engine and transmission removal and replacement, as well as in-car engine repairs, adjustments, and service. This course may be taken four times requiring a different project every semester.

**AT 143 Automotive Parts and Service Advising 3 Units**

*Prerequisite: None*

*Corequisite: AT 100.*

*Advisory: AT 180.*

*Hours: 36 hours LEC; 54 hours LAB*

This course covers the duties and responsibilities of automotive parts and service advisors. Course content includes service and parts merchandising and communication skills, integrated computer management software, cost estimation, enhancing customer satisfaction, scheduling, inventory control, hazardous materials, warranties, lemon laws and documentation requirements.

**AT 145 Automotive Exhaust System 4 Units**

*Formerly: AT 55*

*Prerequisite: AT 100.*

*Hours: 36 hours LEC; 108 hours LAB*

This course is an introduction to the principles and service of exhaust systems including: pipe bending, cutting, welding, installation, repair and inspection. This course prepares students for the ASE (Automotive Service Excellence) exhaust systems test which is required for the ASE Under-Car Specialist Certificate.

**AT 150 Diesel Technology 10 Units**

*Prerequisite: AT 312, WELD 300.*

*Corequisite: AT 100.*

*Hours: 90 hours LEC; 270 hours LAB*

Covers diesel truck engines, power trains and air brakes. Prepares the students for entry-level employment in the diesel truck service and repair industry.

**AT 151 Diesel Technology 10 Units**

*Prerequisite: AT 150.*

*Hours: 90 hours LEC; 270 hours LAB*

Covers diesel truck engines, power trains and air brakes. Prepares the student for entry level employment in the diesel truck service and repair industry.

**AT 165 Advanced DSO/Scanner Operations 1.5 Units**

*Formerly: AT 119*

*Prerequisite: Completion of AT 175, 322, 323, and 324; or hold a current smog license.*

*Hours: 27 hours LEC*

This advanced course covers the use of various lab scopes and hand-held computer scanners with heavy emphasis on wave form analysis and data stream diagnostics. In addition, this course will provide a hands-on approach to evaluating system readiness monitors including mode 6 and 7 validation.

**AT 172 BAR A-6 Alternative - Electrical and Electronic Systems Training 1.5 Units**

*Prerequisite: None*

*Hours: 27 hours LEC*

This course is an intensive Bureau of Automotive Repair-approved review of automotive electrical/electronic systems. It partially satisfies ASE certification requirements when applying for a Smog Check Technician license.

**AT 173 BAR A-8 Alternative - Engine Performance Systems 1.5 Units**

*Prerequisite: None*

*Hours: 27 hours LEC*

This course is an intensive Bureau of Automotive Repair (BAR)-approved review of automotive engine performance offered as an alternative to the ASE A-8 certification. It partially qualifies auto technicians for a Smog Check Technician license exam.

**AT 174 BAR Approved L1 Alternative- Advanced Engine Performance/Emission Systems 2 Units**

*Formerly: AT 112*

*Prerequisite: None*

*Advisory: AT 312 and AT 321 or 322, or engine performance experience in the automotive field.*

*Hours: 36 hours LEC*

This course is preparation for the Bureau of Automotive Repair (BAR) - approved Advanced Engine Performance Exam. Topics covered include Power Train Diagnosis, Computer Control Diagnostics, Ignition System Diagnostics, Fuel and Air Induction Diagnostics, Emission Control System Diagnostics, and I/M Failure Diagnosis. The BAR L1 Alternative test is administered at the end of the class. This course may be taken four times. Credit/No Credit only.

**AT 175 BAR OBD (On Board Diagnostics) II Update Course 1.5 Units**

*Prerequisite: None*

*Hours: 27 hours LEC*

This course presents an overview of automotive On-Board Diagnostic (OBD) systems. Instruction will include a history of OBD systems, computer diagnostics, government and Society of Automotive Engineers (SAE) regulations, OBDII diagnostics, monitors and reference information. This is a Bureau of Automotive Repair approved course.

**AT 176 Bureau of Automotive Repair (BAR) Emissions Update .5-1.5 Units**

*Prerequisite: AT 321 or 324 with a grade of "C" or better; Current California State smog license.*

*Hours: 9-27 hours LEC*

This course is required for all licensed smog technicians who need to meet California emissions controls smog license renewal standards. This course may be taken four times for credit.

**AT 180 Computerized Auto Shop Technical Manuals 3 Units**

*Prerequisite: None*

*Hours: 54 hours LEC*

This course covers all aspects of automotive data retrieval and usage including location and using on-line technical manuals, CDROM-based technical manuals, and text-based technical manuals. Computer-based repair order generation, usage, and technical writing skills as well as computerized automotive shop management systems are included.

## Automotive Technology

### **AT 190      Advanced Student Projects      2 Units**

*Prerequisite: Must have a grade of "C" or better in the Automotive Technology major.*

*Hours: 108 hours LAB*

Opportunity for students to pursue advanced projects which are selected by the department. May be taken twice for credit.

### **AT 201      ASE A-1 Engine Repair Test Preparation      .5 Units**

*Formerly: AT 101*

*Prerequisite: None*

*Hours: 9 hours LEC*

This nine-hour course will help prepare for the ASE (Automotive Service Excellence) A-1 Engine Repair examination by reviewing ASE-style test questions and engine repair information. Credit/No Credit only. This course may be taken four times.

### **AT 202      ASE A-2 Auto Transmission and Transaxles Test Preparation      .5 Units**

*Formerly: AT 102*

*Prerequisite: None*

*Hours: 9 hours LEC*

This nine-hour course will help prepare students for the ASE (Automotive Service Excellence) A-2 Transmission/Transaxle examination by reviewing ASE-style test questions and transmission/transaxle information. Credit/No Credit only. This course may be taken four times.

### **AT 203      ASE A-3 Manual Drive Trains and Axles Test Preparation      .5 Units**

*Formerly: AT 103*

*Prerequisite: None*

*Hours: 9 hours LEC*

This nine-hour course will help prepare students for the ASE (Automotive Service Excellence) A-3 manual drive trains and axles examination by reviewing ASE-style test questions and drive trains information. Credit/No Credit only. This course may be taken four times.

### **AT 204      ASE A-4 Suspension and Steering Test Preparation      .5 Units**

*Formerly: AT 104*

*Prerequisite: None*

*Hours: 9 hours LEC*

This nine-hour course will help prepare students for the ASE (Automotive Service Excellence) A-4 Suspension and Steering examination by reviewing ASE-style questions and suspension and steering information. Credit/No Credit only. This course may be taken four times.

### **AT 205      ASE A-5 Brakes Test Preparation      .5 Units**

*Formerly: AT 105*

*Prerequisite: None*

*Hours: 9 hours LEC*

This nine-hour course will help prepare students for the ASE (Automotive Service Excellence) A-5 Brakes examination by reviewing ASE-style test questions and brakes information. Credit/No Credit only. This course may be taken four times.

### **AT 206      ASE A-6 Electrical/Electronic Systems Test Preparation      .5 Units**

*Formerly: AT 106*

*Prerequisite: None*

*Hours: 9 hours LEC*

This nine-hour course will help prepare students for the ASE (Automotive Service Excellence) A-6 Electrical/Electronic Systems examination by reviewing ASE-style test questions and electrical/electronic systems information. Credit/No Credit only. This course may be taken four times.

### **AT 207      ASE A-7 Heating & Air Conditioning Test Preparation      .5 Units**

*Formerly: AT 107*

*Prerequisite: None*

*Hours: 9 hours LEC*

This nine-hour course will help prepare students for the ASE (Automotive Service Excellence) A-7 Heating & Air Conditioning examination by reviewing ASE-style test questions and heating & air conditioning information. Credit/No Credit only. This course may be taken four times.

### **AT 208      ASE A-8 Engine Performance Test Preparation      .5 Units**

*Formerly: AT 108*

*Prerequisite: None*

*Hours: 9 hours LEC*

This nine-hour course will help prepare students for the ASE (Automotive Service Excellence) A-8 Engine Performance examination by reviewing ASE-style test questions and engine performance information. Credit/No Credit only. This course may be taken four times.

### **AT 209      ASE L-1 Advanced Engine Performance Specialist Test Preparation      .5 Units**

*Formerly: AT 109*

*Prerequisite: None*

*Hours: 9 hours LEC*

This nine-hour course will help prepare students for the ASE (Automotive Service Excellence) L-1 Advanced Engine Performance Specialist examination by reviewing ASE-style test questions and engine repair information. Credit/No Credit only. This course may be taken four times.

### **AT 210      Advanced Automatic Transmission and Transaxle      4 Units**

*Prerequisite: AT 313 with a grade of "C" or better.*

*Hours: 36 hours LEC; 108 hours LAB*

This course covers the advanced aspects of automatic transmission and transaxle diagnosis, service, and repair. Topics include mechanical, electrical, and electronic diagnosis, diagnosis and repair of vibration problems, advanced scan tool operation, and dyno testing.

### **AT 251      Automotive Electronic Accessories and Installation      2 Units**

*Same As: ET 251.*

*Prerequisite: None*

*Hours: 27 hours LEC; 27 hours LAB*

This course covers the electrical principles and processes involved in the installation of stereo sound, alarm and other entertainment, electrical and electronic systems and components. Installation safety, circuit diagrams, inspection, and wiring techniques are covered along with installation techniques of fiber optics, Global Positioning (GPS), and other related systems. Steps for acquiring the Mobile Electronics Certified Professional (MECP) certification are covered to complete the course content. A field trip is required. This course is not open to students who have taken the ET 251 course.

### **AT 294      Topics in Automotive Technology - New and Emerging Occupations      .5-5 Units**

*Prerequisite: To be determined for each topic.*

*Hours: 9-90 hours LEC; 27-270 hours LAB*

Individualized course developed in cooperation with industry to meet specialized training needs.

**AT 298 Work Experience in Automotive Technology 1-4 Units**

Formerly: AT 98

Prerequisite: None

Hours: 18-72 hours LEC

This course is designed for students to earn college credit by combining volunteer or paid work experience and classroom training. Using their jobs as learning situations, the students join with their employers and the college in establishing learning objectives to be accomplished during the semester.

**AT 301 Small Gas Engines 2 Units**

Same As: HORT 330.

Prerequisite: None

Course Transferable to CSU

Hours: 18 hours LEC; 54 hours LAB

This course covers troubleshooting, adjusting and maintaining small gas engines and their applications as they pertain to the automotive and horticulture industries. This course is not open to students who have taken HORT 330.

**AT 310 Heating and Air-Conditioning Systems 4 Units**

Formerly: AT 54

Prerequisite: None

Corequisite: AT 100.

Course Transferable to CSU

Hours: 36 hours LEC; 108 hours LAB

This course is an introduction to automotive heating and air conditioning theory. This course meets ASE standards (Automotive Service Excellence) and will allow the student to combine performance testing and repair practices of A/C systems as utilized in the industry.

**AT 311 Suspension and Steering Systems 4 Units**

Formerly: AT 56

Prerequisite: None

Corequisite: AT 100.

Course Transferable to CSU

Hours: 36 hours LEC; 108 hours LAB

This course is an introduction to advanced principles and service of suspension and steering systems, including: alignment of equipment; alignment procedures; diagnosis and repair of suspension components. It meets ASE (Automotive Service Excellence) certification standards.

**AT 312 Electrical Systems 4 Units**

Formerly: AT 58

Prerequisite: None

Corequisite: AT 100, 105.

Course Transferable to CSU

Hours: 36 hours LEC; 108 hours LAB

This course covers the principles, operation, and diagnosis of automotive electrical systems including: basic engine operation; fundamentals of electricity (DC); electrical circuits; battery operation; fundamentals of magnetism; charging systems; starting systems; schematics. It meets ASE (Automotive Service Excellence) certification standards with completion of AT 320 or 322. It is required of all automotive, autobody, and heavy equipment majors.

**AT 313 Automatic Transmission and Transaxles 4 Units**

Prerequisite: None

Corequisite: AT 100.

Course Transferable to CSU

Hours: 36 hours LEC; 108 hours LAB

This course covers the principles of automatic transmission and transaxle principles and service. Instruction areas include hydraulic principles, diagnosis and service, power conversion, torque conversion, and automatic transmission operation. This course meets Automotive Service Excellence (ASE) standards.

**AT 314 Automotive Engine Repair 4 Units**

Formerly: AT 70

Prerequisite: None

Corequisite: AT 100, 105.

Course Transferable to CSU

Hours: 36 hours LEC; 108 hours LAB

This course covers the principles, operation and diagnosis of automotive engines including: basic engine operation and construction; parts identification and location; engine disassembly procedures; engine diagnosis using metric and English measurement systems; engine repair and rebuilding procedures; engine reassembly procedures. Meets industry standards. Required of all automotive majors.

**AT 315 Advanced Engine/Chassis Electrical 3 Units**

Prerequisite: AT 312 with a grade of "C" or better.

Course Transferable to CSU

Hours: 36 hours LEC; 54 hours LAB

This course covers the principles of advanced diagnosis of engine and chassis electrical systems including power windows, power seats, door systems including keyless entry, multi-plexing systems, electronic engine control systems and systems with memory.

**AT 320 Engine Performance Technology 12 Units**

Formerly: AT 80A

Prerequisite: AT 312 and 314 with a grade of "C" or better.

Course Transferable to CSU

Hours: 108 hours LEC; 324 hours LAB

This course covers the principles and diagnosis of chassis electrical, engine electrical, conventional and electronic computer-controlled ignition systems and basic computer sensors. It includes extensive troubleshooting, use of hand-held test equipment, lab oscilloscopes, scanners, Digital Storage Oscilloscopes (DSO's) and 4 and 5 gas analyzers.

**AT 321 Engine Performance Technology 12 Units**

Prerequisite: AT 320 with a grade of "C" or better.

Course Transferable to CSU

Hours: 108 hours LEC; 324 hours LAB

This course covers theory, operation, and diagnosis of fuel delivery and emission control systems. Fuel supply, electronic feedback carburetors, mechanical and electronic fuel injection, emission components, as well as operation and diagnosis, are also presented. Course includes Bureau of Automotive Repair (BAR) Basic Area Clean Air Course, Enhanced Area Clean Air Course, and BAR Update Course.

**AT 322 Electronic Engine Controls/Engine Performance 5 Units**

Prerequisite: AT 312 and AT 314 with a grade of "C" or better.

Course Transferable to CSU

Hours: 36 hours LEC; 162 hours LAB

This course covers diagnostic principles of electronic engine controls including fuel injection, engine electrical systems, and conventional/electronic/computer controlled ignition systems. It includes extensive troubleshooting, use of hand-test equipment, lab oscilloscopes, computers, and emission components diagnosis. Meets industry ASE standards.

### **AT 323          Basic Area Clean Air Car Course          4 Units**

*Formerly: AT 82*

*Prerequisite: AT 322 with a grade of "C" or better or one year work experience in automotive engine performance.*

*Course Transferable to CSU*

*Hours: 36 hours LEC; 108 hours LAB*

This covers the Bureau of Automotive Repair (BAR) certified Basic Area Clean Air Car Course, which now includes the former On Board Diagnostics (OBD) II update course, and the BAR 2003/2004 update course. This course is required for first time license technicians or those whose license has expired for more than one year. With the completion of AT 324, students may be eligible for the Enhanced Area Test and Repair Exam.

### **AT 324          Enhanced Area Clean Air Car          2 Units**

*Prerequisite: AT 323 or a Basic Technician Smog Check License.*

*Course Transferable to CSU*

*Hours: 36 hours LEC*

This course covers advanced emission testing, service, and repairs for Enhanced Areas of the state of California. Instruction will include the latest in automotive technologies that may affect emissions testing, diagnosis, or repair such as NOX, Digital Storage Oscilloscopes (DSO) usage, sensor waveforms, diagnostic flowcharts, and catalytic converters. Also included are the 8 hours of training required by the Bureau of Automotive Repair (BAR) for transition to loaded mode testing for enhanced emission control areas (BAR 97). All smog check technicians who wish to obtain the Advanced Emission Specialist license must complete this training.