

Automotive Technology

Degree: A.S. - Automotive Collision Technology
A.S. - Automotive Component Service Technician
A.S. - Automotive Technology
A.A. - Diesel Mechanics
A.S. - Electronics Engine Management Systems Technician

Area: Technical Education
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Certificates: Automotive Collision Technology
Automotive Component Service Technician
Automotive Service Technician
Automotive Technology
Diesel Mechanics
Electronics Engine Management Systems
Undercar Service
Transmission Service

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



Website: www.arc.losrios.edu/autotech

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 work on all types of cars. Instruction and practice is provided in diagnosis of malfunctions, disassembly of units, parts inspection and repair or replacement of parts involving engine repair, ignition systems, fuel systems, brakes, transmissions, air conditioning, heating systems, emissions controls, front-end alignment, body and fender repair and the installation of a variety of accessories.

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:

- Chosen as a T-TEN and TSEP 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 exams.

The ARC Program

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 word 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.

TSEP Program

American River College (in partnership with AC Delco) offers a program for technicians who wish to work at independent shops. It is called the Technician Service Education Program (TSEP). Students work in independent shops while attending school and may receive tools, books and tuition scholarships during their training. TSEP students need to take the following classes in order

to receive industry certification: AT 100, 105, 110, 130, 180, 310, 311, 312, 313, 314, 320 or 322, 321 or 323, and 324; Business 100, 350. Paid work experience is a requirement for each semester enrolled in the ARC TSEP program (AT 298 for 8 units - 600 hours). For more information contact the TSEP Coordinator, John McCormack, at (916) 484-8354.

AT 130	4
AT 140	4
AT 180	3
AT 310	4
AT 311	4
AT 312	4
AT 313	4
AT 314	4

Career Opportunities

Automotive technicians are in great demand in California and Sacramento specifically. Independent shops and dealerships constantly seek well-trained technicians. There is a strong demand for automotive technicians with the high-tech skills taught at ARC.

General Education Graduation Requirements: Students must also complete the general education graduation requirements for an A.A. degree. See graduation requirements.

Automotive Service Technician certificate

Prepares the student for entry level employment as an Automotive Service Technician.

Requirements for Certificate: 36 units

Courses Required:	Units
AT 100	2
AT 105	3
AT 110	4
AT 130	4
AT 180	3
AT 310	4
AT 311	4
AT 312	4
AT 313	4
AT 314	4

Automotive Collision Technology

Students are prepared for positions in the field of auto body repair. Students develop skill in metalworking and auto body rebuilding and in using a wide range of repair techniques on unit body and body frame construction.

Requirements for Degree Major: 22.5 units

Core Requirements:	Units
AT 121	2.5
AT 122	4
AT 123	4
AT 124	2.5
AT 126	2
AT 298 Work Experience (3 units each with AT 122 and AT 123)	6
WELD 103	1.5

Requirements for Certificate: 22.5 units

Courses Required:	Units
AT 121	2.5
AT 122	4
AT 123	4
AT 124	2.5
AT 126	2
AT 298 (3 units each with AT 122 and AT 123)	6
WELD 103	1.5

Automotive Technology

Students are prepared for entry-level positions in the automotive mechanics trade. This program is ASE certified as a master educational program.

Requirements for Degree Major: 60 units

Core Requirements:	Units
AT 100	2
AT 105	3
AT 110	4
AT 130	4
AT 180	3
AT 310	4
AT 311	4
AT 312	4
AT 313	4
AT 314	4
AT 320	12
AT 321	12

Automotive Component Service Technician

Prepares the student for employment in the repair of various automobile components including those requiring computerized technology.

Requirements for Degree Major: 40 units

Core Requirements:	Units
AT 100	2
AT 105	3
AT 110	4
AT 130	4
AT 140	4
AT 180	3
AT 310	4
AT 311	4
AT 312	4
AT 313	4
AT 314	4

Requirements for Certificate: 40 units

Courses Required:	Units
AT 100	2
AT 105	3
AT 110	4

Requirements for Certificate: 60 units

Courses Required:	Units
AT 100	2
AT 105	3
AT 110	4
AT 130	4
AT 180	3
AT 310	4
AT 311	4
AT 312	4
AT 313	4
AT 314	4
AT 320	12
AT 321	12
<i>Recommended Electives: WELD 300</i>	3

Automotive Technology

Diesel Mechanics

Prepares the student for entry-level employment in the diesel truck service and repair industry. Program covers diesel truck engines, power trains and electrical systems.

Requirements for Degree Major: **54 units**

Core Requirements: **Units**

AT 105	3
AT 110	4
AT 130	4
AT 150	10
AT 151	10
AT 310	4
AT 311	4
AT 312	4
AT 313	4
AT 314	4
WELD 300	3

Requirements for Certificate: **54 units**

Courses Required: **Units**

AT 105	3
AT 110	4
AT 130	4
AT 150	10
AT 151	10
AT 310	4
AT 311	4
AT 312	4
AT 313	4
AT 314	4
WELD 300	3

Electronics engine management systems technician

Requirements for Degree Major: **47 units**

Core Requirements: **Units**

AT 100	2
AT 105	3
AT 110	4
AT 130	4
AT 180	3
AT 310	4
AT 311	4
AT 312	4
AT 313	4
AT 314	4
AT 322	5
AT 323	4
AT 324	2

Requirements for Certificate: **47 units**

Courses Required: **Units**

AT 100	2
AT 105	3
AT 110	4
AT 130	4
AT 180	3
AT 310	4
AT 311	4
AT 312	4
AT 313	4

AT 314	4
AT 322	5
AT 323	4
AT 324	2

General Education Graduation Requirements: Students must also complete the general education graduation requirements for an A.A. degree. See graduation requirements. Degree requires a minimum of 5 semesters.

Transmission Service Certificate

Prepares the student for entry level employment as a Transmission Service Technician.

Requirements for Certificate: **24 units**

Courses Required: **Units**

AT 100	2
AT 105	3
AT 130	4
AT 140	4
AT 180	3
AT 312	4
AT 313	4

Undercar Service Certificate

Prepares the student for entry level employment as an Undercar Service Technician.

Requirements for Certificate: **24 units**

Courses Required: **Units**

AT 100	2
AT 105	3
AT 110	4
AT 140	4
AT 145	4
AT 180	3
AT 311	4

Air Conditioning Service Certificate

Prepares the student for entry level employment as an Air Conditioning Service Technician.

Requirements for Certificate: **16 Units**

Courses Required: **Units**

AT 100	2
AT 105	3
AT 180	3
AT 310	4
AT 312	4

Parts and Service Certificate

Requirements for Certificate: **17 Units**

Courses Required: **Units**

AT 100	2
AT 105	3
AT 107	2
AT 143	3
AT 180	3
AT 298	1
BUS 100	3
BUSTEC 300 (or 25 wpm)	0

AT 10 General Automotive Maintenance 2 Units

Formerly: AT 200

Prerequisite: None

Course Not Transferable UC or CSU

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

Course Not Transferable UC or CSU

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

Course Not Transferable UC or CSU

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

Course Not Transferable UC or CSU

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 D2

AT 106 Automotive Dealership Operations 2 Units

Prerequisite: None

Course Not Transferable UC or CSU

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 Careers (same as ET 250 and WELD 150) 2 Units

Formerly: AT 118

Prerequisite: None

Course Not Transferable UC or CSU

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. AA/AS area E2

AT 110 Automotive Brakes 4 Units

Formerly: AT 57

Prerequisite: None

Corequisite: AT 100.

Course Not Transferable UC or CSU

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

Formerly: AT 62A

Prerequisite: None

Course Not Transferable UC or CSU

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.

AT 122 Automotive Collision - Non-Structural Repairs 4 Units

Formerly: AT 62B

Prerequisite: None

Corequisite: AT 298.

Course Not Transferable UC or CSU

Hours: 72 hours LEC

This course is designed to provide the technical information necessary 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 vs. replacement decisions will be covered. Measuring systems and techniques and their use in diagnosing and correcting collision damage are covered.

AT 123 Automotive Collision - Structural Panel and Component Repairs 4 Units

Formerly: AT 62C

Prerequisite: None

Corequisite: AT 298.

Course Not Transferable UC or CSU

Hours: 72 hours LEC

This course covers the advanced principles and theory of automobile collision repair: component alignment, component replacement, structural panel repair and replacement, and chassis/frame alignment. Sectioning and full-panel replacement techniques and procedures will be covered.

AT 124 Automotive Refinishing Technology 2.5 Units

Formerly: AT 63

Prerequisite: None

Course Not Transferable UC or CSU

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

Formerly: AT 64

Prerequisite: None

Course Not Transferable UC or CSU

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.

Course Not Transferable UC or CSU

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

Formerly: AT 50

Prerequisite: None

Course Not Transferable UC or CSU

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

Formerly: AT 71

Prerequisite: None

Corequisite: AT 100.

Course Not Transferable UC or CSU

Hours: 36 hours LEC; 108 hours LAB

This course covers the basics of manual transmissions and transaxles principles and service. Areas of instruction include: clutches; manual transmissions and transaxles; drive lines 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

Formerly: AT 78

Prerequisite: None

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

Course Not Transferable UC or CSU

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.

AT 143 Automotive Parts and Service Advising 3 Units

Formerly: AT 115

Prerequisite: None

Corequisite: AT 100.

Advisory: AT 180.

Course Not Transferable UC or CSU

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.

Course Not Transferable UC or CSU

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

Formerly: AT 73A

Prerequisite: AT 312, WELD 300.

Corequisite: AT 100.

Course Not Transferable UC or CSU

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

Formerly: AT 73B

Prerequisite: AT 150.

Course Not Transferable UC or CSU

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.

Course Not Transferable UC or CSU

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 Unit

Formerly: AT 110

Prerequisite: None

Course Not Transferable UC or CSU

Hours: 18 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

Formerly: AT 111

Prerequisite: None

Course Not Transferable UC or CSU

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.

Course Not Transferable UC or CSU

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

Formerly: AT 114

Prerequisite: None

Course Not Transferable UC or CSU

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) 2003/04 Update .5 Units

Formerly: AT 116

Prerequisite: Current California state smog license.

Course Not Transferable UC or CSU

Hours: 9 hours LEC

This course is designed for all licensed smog technicians who need to meet California smog license renewal requirements after January 1, 2003. Successful completion will renew the technician's Basic Area or Enhanced Area Smog Check License.

AT 180 Automotive Data Acquisition 3 Units

Formerly: AT 92

Prerequisite: None

Course Not Transferable UC or CSU

Hours: 54 hours LEC

This course covers all aspects of automotive data retrieval and usage including locating 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 will also be included.

AT 190 Advanced Student Projects 2 Units

Formerly: AT 83

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

Course Not Transferable UC or CSU

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

Course Not Transferable UC or CSU

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

Course Not Transferable UC or CSU

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

Course Not Transferable UC or CSU

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

Course Not Transferable UC or CSU

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

Course Not Transferable UC or CSU

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 4 four times.

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

Formerly: AT 106

Prerequisite: None

Course Not Transferable UC or CSU

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

Course Not Transferable UC or CSU

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

Course Not Transferable UC or CSU

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

Course Not Transferable UC or CSU

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 294 Topics in Automotive Technology 5-5 Units

Formerly: AT 93

Prerequisite: To be determined for each topic.

Course Not Transferable UC or CSU

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

Course Not Transferable UC or CSU

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 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

Formerly: AT 60

Prerequisite: None

Corequisite: AT 100.

Course Transferable to CSU

Hours: 36 hours LEC; 108 hours LAB

This course covers the basics of automatic transmission and transaxles principles and services. Instruction areas include: hydraulic principles and application; power conversion and torque conversion; and automatic transmission operation. This course meets 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

Formerly: AT 80B

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

Advisory: AT 320.

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 On Board Diagnostics (OBD) II, Bureau of Automotive Repair (BAR 97) 8 hour training, BAR 90 Clean Air Car Course and the BAR 8 hour update course for 2003/2004.

AT 322 Electronic Engine Controls/Engine Performance 5 Units

Formerly: AT 81

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

Course Not Transferable UC or 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

Formerly: AT 84

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 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.