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:
- ASE certified instructors and programs.
- Students may begin 5-week courses 3 times during the semester.
- 5-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.

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.

Student Learning Outcomes
Upon completion of this program, the student will be able to:
- Identify and implement safety procedures involved in the diagnosis, service and repair of all major automobile and light truck systems.
- Describe the function, operation and characteristics of all major components in the following automotive systems: engines, transmissions, brakes, suspension, electrical, air conditioning, emission control and computerized engine controls.
- Identify and follow manufacture standards for proper automobile diagnosis and repair.
- Operate hand and power tools necessary for automobile and light truck repair.
- Operate diagnostic equipment and interpret test results.
- Demonstrate the skills and knowledge to analyze, diagnose, and repair automotive engines, automatic and manual transmissions, suspension systems, braking systems, electrical systems, fuel delivery systems, ignition systems, emissions control systems, and computerized engine controls.

Career Opportunities
Automotive Technician; Smog Check Technician

Requirements for Degree or Certificate 52 Units

| 1st Semester | AT 100 | Technical Basics for the Automotive Professional ..........2 |
| AT 105 | Mathematics for Automotive Technology ..................3 |
| AT 180 | Automotive Data Acquisition ..............................3 |
| 2nd Semester | AT 110 | Automotive Brakes .............................................4 |
| AT 311 | Suspension and Steering Systems ..........................4 |
| AT 312 | Electrical Systems .............................................4 |
| 3rd Semester | AT 130 | Manual Drive Trains and Axles ...............................4 |
| AT 313 | Automatic Transmission and Transaxles .....................4 |
| AT 314 | Automotive Engine Repair ....................................4 |
| 4th Semester | AT 310 | Heating and Air-Conditioning Systems ........................4 |
| AT 312 | Engine Performance and Electronic Engine Controls ....6 |
| Final Semester | AT 315 | Advanced Engine/Chassis Electrical ........................4 |
| AT 323 | Clean Air Car Course ...........................................6 |

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 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.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

• Diagnose and repair major automotive components.
• Describe the relationships between automotive components.
• Complete service and repair work to industry time and quality standards.
• Follow Federal EPA guidelines for handling and use of hazardous material found in an automotive shop.
• Demonstrate safe work practices in the auto shop.

Career Opportunities

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

Requirements for Degree or Certificate 40 Units

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>AT 100</td>
<td>Technical Basics for the Automotive Professional</td>
<td>2</td>
</tr>
<tr>
<td>AT 105</td>
<td>Mathematics for Automotive Technology</td>
<td>3</td>
</tr>
<tr>
<td>AT 110</td>
<td>Automotive Brakes</td>
<td>4</td>
</tr>
<tr>
<td>AT 130</td>
<td>Manual Drive Trains and Axles</td>
<td>4</td>
</tr>
<tr>
<td>AT 140</td>
<td>Advanced Automotive Skill and Speed Development</td>
<td>4</td>
</tr>
<tr>
<td>AT 180</td>
<td>Automotive Data Acquisition</td>
<td>3</td>
</tr>
<tr>
<td>AT 310</td>
<td>Heating and Air-Conditioning Systems</td>
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<td>AT 311</td>
<td>Suspension and Steering Systems</td>
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<tr>
<td>AT 312</td>
<td>Electrical Systems</td>
<td>4</td>
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<tr>
<td>AT 313</td>
<td>Automatic Transmission and Transaxes</td>
<td>4</td>
</tr>
<tr>
<td>AT 314</td>
<td>Automotive Engine Repair</td>
<td>4</td>
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</tbody>
</table>

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. This program also prepares the student for Automotive Service Excellence (ASE) certification in Air Conditioning A-7.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

• Apply algebraic and mathematical concepts essential to and for advancement in the automotive industry.
• Operate equipment and tools safely.
• Evaluate, adjust, test and diagnose components/system malfunctions.
• Diagnose, assess and repair manual and automatic transmissions and transaxles.
• Locate, download and analyze technical manuals from the internet, cdroms, and text sources.
• Analyze, diagnose, and repair automotive electrical and electronic systems to ASE performance level.
• Diagnose, trouble shoot, and repair basic Air-Conditioning (AC) Systems.
• Diagnose, disassemble, inspect, clean and reassemble components of the steering and suspension system.
• Analyze, diagnose, and repair engines to ASE performance levels.
• Analyze, and repair fuel injection systems to ASE standards.
• Diagnose engine emission control systems to ASE standards.
• Prepare for the state EA smog certification.

Requirements for Degree or Certificate 60 Units

<table>
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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>AT 100</td>
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<td>AT 313</td>
<td>Automatic Transmission and Transaxes</td>
<td>4</td>
</tr>
<tr>
<td>AT 314</td>
<td>Automotive Engine Repair</td>
<td>4</td>
</tr>
</tbody>
</table>

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.

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.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

• Identify and implement safety procedures involved in the service and repair of Automotive Heating, Ventilation, Air Conditioning (HVAC) systems.
• Describe the function, operation and characteristics of each component in automotive HVAC systems.
• Operate diagnostic equipment and interpret results from the equipment.
• Diagnose automotive HVAC systems including manual, semi-automatic, and automatic.
• Repair automotive HVAC systems including manual, semi-automatic, and automatic.
• Diagnose engine cooling systems.
• Repair engine cooling systems.
• Follow Federal EPA guidelines for the handling and use of refrigerants.

Requirements for Certificate 16 Units

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<tr>
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<tbody>
<tr>
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<td>AT 105</td>
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<td>AT 180</td>
<td>Automotive Data Acquisition</td>
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<tr>
<td>AT 310</td>
<td>Heating and Air-Conditioning Systems</td>
<td>4</td>
</tr>
<tr>
<td>AT 312</td>
<td>Electrical Systems</td>
<td>4</td>
</tr>
</tbody>
</table>
Alternative Fuels Certificate
This certificate covers advanced applications of emissions-related principles on alternative fuels vehicles. Topics include fuel control, fuel delivery, and efficiency management of modern automobiles.

Student Learning Outcomes
Upon completion of this program, the student will be able to:
• describe the requirements for converting fossil fuel vehicles to biodiesel vehicles.
• describe the process of making biodiesel.
• evaluate repairs by utilizing test equipment, such as digital volt ohm meters, digital storage oscilloscopes, and scan-tools.
• describe the chemical composition of various fuels.
• test electronic and electrical components and identify failures.
• assess the benefits of alternative fuel vehicles.

Career Opportunities
The alternative fuels industry is rapidly growing. Professional technicians today are required to modify and repair alternative fuel vehicles. This certificate prepares automotive students for entrance into this field.

Requirements for Certificate 18 Units
AT 100 Technical Basics for the Automotive Professional ..................2
AT 105 Mathematics for Automotive Technology ...........................3
AT 110 Automotive Brakes .........................................................4
AT 120 Automotive Collision Estimating II .....................................2
AT 121 Heating and Air-Conditioning Systems .................................4
AT 122 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 .........................................................1
And a minimum of 1 unit from the following: ................................1
BUSTEC 300 Beginning Keyboarding/Applications (1 - 3)

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 120 Automotive Brakes .........................................................4
AT 122 Automotive Collision Estimating II .....................................2
AT 126 Heating and Air-Conditioning Systems .................................4
AT 127 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 .........................................................1
And a minimum of 1 unit from the following: ................................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, Electrical Systems, Automatic Transmission and Transaxles, and Automotive Engine Repair.

Student Learning Outcomes
Upon completion of this program, the student will be able to:
• apply essential algebraic and mathematical concepts in the automotive industry.
• operate equipment and tools safely.
• evaluate, adjust, test and diagnose brake components/system malfunctions.
• diagnose, assess and repair manual transmission and transaxles.
• locate, download, and analyze technical manuals from the Internet, CDROM, and text sources.
• diagnose and troubleshoot basic Electrical and Electronic systems.
• diagnose malfunctions and disassemble, inspect, clean and reassemble all components of the steering and suspension systems in accordance with service manual procedures.
• diagnose and repair electrical systems at industry ASE performance standard levels.
• diagnose and repair electrical systems at industry ASE performance standard levels.

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 120 Automotive Collision Estimating II .....................................2
AT 124 Heating and Air-Conditioning Systems .................................4
AT 126 Suspension and Steering Systems .......................................4
AT 127 Suspension and Steering Systems .......................................4
AT 128 Electrical Systems .............................................................4
AT 131 Manual Drive Trains and Axles ............................................4
AT 180 Automotive Data Acquisition .............................................3
AT 181 Heating and Air-Conditioning Systems .................................4
AT 182 Electrical Systems .............................................................4
AT 183 Automatic Transmission and Transaxles ...............................4
AT 184 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.

Student Learning Outcomes
Upon completion of this program, the student will be able to:
• apply established procedures in the automotive industry.
• ensure the satisfactory resolution of service-related customer issues.
• create a service work including dispatching and invoicing.

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 .............................................................3
AT 146 Automotive Service Advising .............................................3
AT 180 Automotive Data Acquisition .............................................3
And a minimum of 1 unit from the following: ................................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.

Student Learning Outcomes
Upon completion of this program, the student will be able to:
• analyze an automotive transmission, applying elements of drive-train theory.
• investigate an automotive electrical malfunction by locating, testing and identifying the failure in order to make the necessary repairs.
• research and synthesize brake, suspension and exhaust system information on electronic service manuals to provide information on repairs to meet industry standards.
• identify modern exhaust system components and demonstrate how they relate to California emission control laws.
• describe the operation of drive-train components in order to report and justify a recommended repair procedure.
• apply gear theory to drive-train malfunction.
• evaluate and recognize the drive-train malfunction.

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 150 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.

Student Learning Outcomes
Upon completion of this program, the student will be able to:
• develop a resume and cover letter to plan for future career opportunities.
• perform run out and parallelism evaluations on brake rotors and machine to manufacturer's specifications.
• measure and analyze suspension angles of a modern automobile and make adjustments necessary to bring the angle within manufacturer's specifications.
• identify modern exhaust system components and demonstrate how they relate to California emission control laws.
• research and synthesize brake, suspension and exhaust system information on electronic service manuals to provide information on repairs to meet industry standards.

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 100 Technical Basics for the Automotive Professional 2 Units
Hours: 36 hours LEC; 27 hours LAB
This course presents theoretical and practical training for entry-level automotive technicians. It presents 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 105 Mathematics for Automotive Technology 3 Units
General Education: AA/AS Area II(b)
Hours: 54 hours LEC
This course covers mathematics as it relates to the automotive trades. Metric system, fraction, decimal equivalents, basic equations, ratio and proportion, gear and pulley ratios, power, efficiency, torque and thrust are covered.

AT 106 Automotive Dealership Operations 2 Units
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 department's positions and operations. Customer Satisfaction Index (CSI) and the Bureau of Automotive Repair (BAR) are discussed. Field trips to local dealerships may be required.

AT 107 Employability Skills for Technical Careers 2 Units
Same As: ET 250 and WELD 150
General Education: AA/AS Area III(b)
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.

AT 108 Successful Automobile Selling Skills 1.5 Units
Hours: 27 hours LEC
This course covers successful automobile sales techniques. Topics include the process of selling cars, from greeting the consumer to closing the sale. It also covers understanding today's information age consumer.

AT 110 Automotive Brakes 4 Units
Corequisite: AT 100 and 180
Hours: 54 hours LEC; 54 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 Automotive Service Excellence (ASE) A5 standards.
<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT 121</td>
<td>Automotive Collision - Removal and Replacement of Non-Structural Components and Damage Analysis</td>
<td>4</td>
<td>This course provides the technical information and hands-on experience to perform repairs to collision damaged vehicles. Topics covered are to correctly and safely remove, inspect, replace and align, bolt-on body components. It also covers the protection of mechanical and electrical systems, removal of damaged parts, anchoring theory and techniques applicable to damaged vehicles. Interpretation of damage analysis reports and types of collision damage are covered. Students enrolled in the Collision Technology program at American River College (ARC) may be eligible to apply for Inter-Industry Conference on Automotive Collision Repair (I-CAR) points. This ARC/I-CAR alliance course prepares students for Automotive Service Excellence (ASE) testing and National Automotive Technicians Education Foundation (NATEF) training standards.</td>
</tr>
<tr>
<td>AT 122</td>
<td>Automotive Collision - Non-Structural Repairs</td>
<td>4</td>
<td>This course provides the technical information and hands-on experience to perform limited and supervised repairs to collision damaged vehicles. It covers the principles and theory of automobile collision repair including procedures for replacement of door skins and quarter panels. Additionally, metal straightening theory, and techniques for steel and aluminum, and making repair versus replacement decisions are covered. Measuring systems techniques and their use in diagnosing and correcting collision damage are also presented. Students enrolled in the Collision Technology program at American River College (ARC) may be eligible to apply for Inter-Industry Conference on Automotive Collision Repair (I-CAR) points. This ARC/I-CAR alliance course prepares students for Automotive Service Excellence (ASE) testing and National Automotive Technicians Education Foundation (NATEF) training standards.</td>
</tr>
<tr>
<td>AT 123</td>
<td>Automotive Collision - Structural Panel &amp; Component Repairs</td>
<td>4</td>
<td>This course covers principles and theory of automobile collision repair including component alignment, component replacement, structural panel repair or replacement, and chassis/frame alignment. Sectioning and full-panel replacement techniques and procedures are covered. Practical applications are emphasized. Students enrolled in the Collision Technology program at American River College (ARC) may be eligible to apply for Inter-Conference on Automotive Collision Repair (I-CAR) points. This ARC/I-CAR alliance course also prepares students for Automotive Service Excellence (ASE) testing and National Automotive Technicians Education Foundation (NATEF) training standards.</td>
</tr>
<tr>
<td>AT 124</td>
<td>Automotive Refinishing Technology</td>
<td>4</td>
<td>This course covers the principles and theories of paint finish application, tinting and blending, color evaluation, color adjustment, and evaluating color mismatch problems. Topics include paint application techniques, restoration of corrosion protection, blending procedures, new and emerging paint technologies, color identification, and interpreting vehicle color codes. It also addresses compliance with rules and regulations as determined by Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), Clean Air Act, and Volatile Organic Compound (VOC). Students enrolled in the Collision Technology program at American River College (ARC) may be eligible to apply for Inter-Industry Conference on Automotive Collision Repair (I-CAR) points. This ARC/I-CAR alliance course also prepares students for Automotive Service Excellence (ASE) testing and National Automotive Technicians Education Foundation (NATEF) training standards.</td>
</tr>
<tr>
<td>AT 126</td>
<td>Automotive Collision Estimating</td>
<td>2</td>
<td>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.</td>
</tr>
<tr>
<td>AT 127</td>
<td>Automotive Collision Estimating II</td>
<td>2</td>
<td>Prerequisite: AT 126 with a grade of “C” or better. 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.</td>
</tr>
<tr>
<td>AT 130</td>
<td>Manual Drive Trains and Axles</td>
<td>4</td>
<td>This course covers the basics of manual transmission and transaxles principles and service. Topics include clutches, manual transmissions and transaxles, drive line and shafts, differentials/limited slip differentials, and four-wheel drive/all-wheel drive. This course meets Automotive Service Excellence (ASE) standard A3.</td>
</tr>
<tr>
<td>AT 140</td>
<td>Advanced Automotive Skill and Speed Development</td>
<td>4</td>
<td>This course introduces the key workings of automotive systems and their related parts. It also offers preparation for the Automotive Service Excellence (ASE) P-2 Parts Specialist test. Topics include suspension systems, hazardous waste regulations, and inventory management.</td>
</tr>
<tr>
<td>AT 143</td>
<td>Automotive Parts</td>
<td>3</td>
<td>Prerequisite: AT 100 with a grade of “C” or better. This course is an introduction to the principles and service of exhaust systems, including pipe bending, cutting, welding, installation, repair, and inspection. It prepares students for the Automotive Service Excellence (ASE XI) exhaust systems test, which is required for the ASE Under-Car Specialist Certificate. Different welding techniques are covered each semester. This course may be taken three times with a different technique.</td>
</tr>
<tr>
<td>AT 145</td>
<td>Automotive Exhaust System</td>
<td>4</td>
<td>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.</td>
</tr>
</tbody>
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AT 146 Automotive Service Advising 3 Units
Corequisite: AT 180
Advisory: AT 100
Hours: 45 hours LEC, 27 hours LAB
This course introduces the basic requirements needed to perform the duties of an automotive service advisor. It also offers preparation for the Automotive Service Excellence (ASE) C-1 Service Consultant exam. Topics include utilization of diagnostic flow charts, recruiting techniques, and understanding of small business operations.

AT 150 Introduction to Diesel Technology 4 Units
Hours: 54 hours LEC, 54 hours LAB
This course introduces the field of diesel technology. It covers proper safety and hazardous waste training, use of basic hand and power tools, and the basic workings of the diesel engine.

AT 151 Diesel Engine Repair 4 Units
Hours: 54 hours LEC, 54 hours LAB
This course covers basic engine principles for the diesel engine. It covers disassembly and reassembly of diesel engine systems, including cleaning and safe removal of engines, fuel injection systems, valve trains, and engine heads.

AT 152 Basic Hydraulic Principles of Diesel Technology 4 Units
Hours: 54 hours LEC, 54 hours LAB
This course provides an introduction to the basic hydraulic principles and functions of the diesel engine. Topics include hydraulic fundamentals and principles, functions of hydraulic fluids, directional and flow control valves, and machine hydraulic overview.

AT 153 Diesel Brake Systems 4 Units
Advisory: AT 100
Hours: 54 hours LEC, 54 hours LAB
This course covers the operation of diesel brake systems and components. Topics include band, shoe, caliper, and full disc brakes.

AT 154 Diesel Electrical Systems 4 Units
Corequisite: AT 105
Advisory: AT 100
Hours: 54 hours LEC, 54 hours LAB
This course covers the operation of diesel electrical systems. Topics include electrical circuits, test instruments, charging systems, and electrical starting systems.

AT 155 Diesel Power Trains 4 Units
Hours: 54 hours LEC, 54 hours LAB
This course covers the diesel power train. Topics include inspection and adjustment of clutch linkage, flywheel inspection, and replacement of clutch brakes.

AT 156 Light Duty Diesel/Green Diesel Technology 4 Units
Prerequisite: AT 312 and 314 with grades of "C" or better
Hours: 54 hours LEC, 54 hours LAB
This course introduces the diagnosis and repair of light duty diesel vehicles and covers the theory and operation of light duty diesel engines and their fuel delivery systems. Topics include diesel engine characteristics, early mechanical fuel delivery systems, early cylinder head design and early engine construction. It also covers how to prepare these engines for conversion to green technology, such as low sulfur fuel, biodiesel, and alternative fuels. This course along with AT 157 is applicable for the field technician seeking training for ASE A9 certification and preparation for green technologies.

AT 157 Advanced Light Duty Diesel/Green Diesel Technology 4 Units
Prerequisite: AT 156 with a grade of "C" or better
Hours: 54 hours LEC, 54 hours LAB
This course focuses on late-model turbo-charged light duty diesel vehicles operating on low sulfur, biodiesel, or alternative fuels. Topics include computer controlled injection and emission control systems, sensors, actuators, computer modules, exhaust gas recirculation systems (EGR), particulate traps, selective catalytic reduction systems (SCR) and lean oxides of nitrogen (NOx) traps. Diagnosis and repair of these systems are covered using computer diagnostic equipment to meet state emission compliance. This course along with AT 156 is applicable for the field technician seeking training for ASE A9 certification and preparation for green technologies.

AT 172 BAR A-6 Alternative - Electrical and Electronic Systems Training 1.5 Units
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
Hours: 27 hours LEC
This course is an intensive Bureau of Automotive Repair-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
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 176 Bureau of Automotive Repair (BAR) Emissions Update 1 Unit
Hours: 18 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 179 Snap-On MODIS 7 Automotive Diagnostic Use and Operation .5 Unit
Hours: 9 hours LEC
This course explores the functionality and capability of Snap-On’s Modular Diagnostic System (MODIS) to improve the technician’s diagnostic expertise when confronted with vehicle performance complaints, emission failures, or any other On-Board computer related problem.
AT 188 Automotive Data Acquisition 3 Units
Hours: 54 hours LEC
This course covers the skills needed to adequately retrieve and apply automotive data acquisition, including on-line technical manuals, CD-ROM based technical manuals and computerized shop management programs. Computer-based automotive service repair order generation is covered as well as usage and application currently utilized in many automotive repair facilities.

AT 190 Advanced Student Projects 2 Units
Prerequisite: AT 100 with a grade of "C" or better
Hours: 108 hours LAB
This course provides opportunities to pursue advanced laboratory projects in all eight of the Automotive Service Excellence (ASE) educational areas. Projects are selected by the automotive department. This course may be taken four times for credit on different projects.

AT 251 Automotive Electronic Accessories and Installation 3 Units
Same As: ET 251
Corequisite: AT 312 or ET 302
Hours: 36 hours LEC; 54 hours LAB
This course covers the principles and processes involved in the installation of mobile entertainment, security, positioning and other electrical and electronic related systems and components. Safety, circuit diagrams, inspection, wiring, installation and troubleshooting techniques are covered along with the operational characteristics of the various electrical circuits. Topics related to this course cover the areas for the certification testing required to become a qualified Mobile Electronics Certified Professional (MECP) installer. A field trip is required. This course is not open to students who have taken ET 251.

AT 294 Topics in Automotive Technology .5-3 Units
Hours: 9-54 hours LEC; 27-162 hours LAB
This course provides opportunity to study current topics in automotive technology that are not included in existing courses. It may be taken four times for a maximum of six units, provided there is no duplication of topics.

AT 298 Work Experience in Automotive Technology 1-4 Units
Advisory: AT 100
General Education: AA/AS Area III(b)
Enrollment Limitation: Be in a paid or non-paid internship, volunteer opportunity or job related to the automotive industry.
Hours: 60-300 hours LAB
This course provides students with opportunities to develop marketable skills in preparation for employment in the automotive field. It is designed for students interested in work experience and/or internships in the automotive industry. Course content includes understanding the application of education to the workforce; completion of required forms which document the student’s progress and hours spent at the work site; and developing workplace skills and competencies. Rigor is ensured through the development of appropriate level learning objectives set between the student and the employer. During the course of the semester, the student is required to fulfill a weekly orientation and 75 hours of related paid work experience, or 60 hours of unpaid work experience for one unit. An additional 75 or 60 hours of related work experience is required for each additional unit. The weekly orientation is required for first time participants, returning participants are not required to attend the weekly orientation but are required to meet with the instructor as needed to complete all program forms and assignments. WEXP 298 may be taken for a total of 16 units when there are new or expanded learning objectives. Students can earn a total of 16 Work Experience units.

AT 301 Small Gas Engines, Outdoor Power Equipment 4 Units
Same As: HORT 330
Course Transferable to CSU
Hours: 54 hours LEC; 54 hours LAB
This course covers the basic operational theory, servicing, adjusting, and maintenance of 2-cycle and 4-cycle small gas engines as they pertain to the automotive and horticulture industries. AT 301 and/or HORT 330 may be taken two times for credit for a maximum of 8 units, using different equipment.

AT 307 Biodiesel Technology 4 Units
Corequisite: AT 100 or 150
Course Transferable to CSU
Hours: 54 hours LEC; 54 hours LAB
This course covers the chemistry, production, and impact of biodiesel technology. It also covers how to convert vehicle fuel systems to biodiesel and how this process affects warranties.

AT 310 Heating and Air-Conditioning Systems 4 Units
Corequisite: AT 100.
Course Transferable to CSU
Hours: 54 hours LEC; 54 hours LAB
This course is an introduction to automotive heating and air conditioning theory. It meets Automotive Service Excellence (ASE) standard A7 and combines performance testing and repair practices as utilized in the industry.

AT 311 Suspension and Steering Systems 4 Units
Corequisite: AT 100.
Course Transferable to CSU
Hours: 54 hours LEC; 54 hours LAB
This course is an introduction to advanced principles and service of suspension and steering systems, including alignment of equipment, adjustment procedures, and the diagnosis and repair of suspension components. It meets Automotive Service Excellence (ASE) certification standards.

AT 312 Electrical Systems 4 Units
Corequisite: AT 100 and 105.
Course Transferable to CSU
Hours: 54 hours LEC; 54 hours LAB
This course covers the principles, operation, and diagnosis of automotive electrical systems including fundamentals of electricity (DC), electrical circuits, battery operation, fundamentals of magnetism, charging systems, starting systems and electrical schematics. This course meets Automotive Service Excellence (ASE) certification standards for the A6 electrical certification with completion of AT 315 and either AT 320 or AT 322.

AT 313 Automatic Transmission and Transaxles 4 Units
Corequisite: AT 100
Course Transferable to CSU
Hours: 54 hours LEC; 54 hours LAB
This course covers the basics of automatic transmission and transaxle principles and service. Topics include hydraulic principles, diagnosis and service, power conversion, and automatic transmission operation. AT 313 and AT 317 together meet Automotive Service Excellence (ASE) standard A2.
AT 314 Automotive Engine Repair 4 Units
Corerequisite: AT 100 and 105.
Course Transferable to CSU
Hours: 54 hours LEC, 54 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, and engine reassembly procedures. Completion of AT 314 and either AT 320 or AT 322 meets Automotive Service Excellence (ASE) A1 standards.

AT 315 Advanced Electrical: Engine/Chassis/Hybrid 4 Units
Prerequisite: AT 312 with a grade of “C” or better
Course Transferable to CSU
Hours: 54 hours LEC, 54 hours LAB
This course covers the principles of advanced diagnostics of engine, chassis, and hybrid electrical systems. Topics include power windows, power seats, power locks (including keyless entry), multiplexing systems, computer-controlled charging systems, navigation systems, factory installed accessory circuits, and hybrid powertrain control systems. It meets Automotive Service Excellence (ASE) certification standards for the A6 electrical certification with the completion of AT 312 and either AT 320 or AT 322.

AT 316 Alternative Fuels and Advanced Technology Vehicles 4 Units
Corerequisite: AT 100 or 150
Course Transferable to CSU
Hours: 54 hours LEC, 54 hours LAB
This course provides an overview of existing fuels (hydrocarbon), renewable/sustainable alternative fuels, gaseous, and future fuels. It covers how they function in various fuel delivery systems, including hybrid, by examining the history, chemistry, production, and practicality of each. Field trips may be required.

AT 317 Advanced Drivetrain 4 Units
Prerequisite: AT 313 with a grade of “C” or better
Hours: 54 hours LEC, 54 hours LAB
This course covers 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 dynamometer testing. AT 317 and AT 313 together meet Automotive Service Excellence (ASE) standard A2.

AT 320 Engine Performance Technology 12 Units
Prerequisite: AT 312 and 314 with grades of “C” or better
Course Transferable to CSU
Hours: 162 hours LEC, 162 hours LAB
This course covers the principles and diagnosis of the following systems: chassis electrical, engine electrical, engine mechanical, conventional and electronic-computer-controlled ignition systems, basic fuel injection, and basic computer systems. It also includes extensive troubleshooting with use of hand-held test equipment, lab oscilloscopes, scanners, digital storage oscilloscopes (DSO) and 4- and 5-gas analyzers. It meets Bureau of Automotive Repair (BAR) and Automotive Service Excellence (ASE) A-8 certifications. It also satisfies A-1 and A-6 requirements when AT 312, AT 314 and AT 315 are completed.

AT 321 Engine Performance Technology 12 Units
Prerequisite: AT 320 with a grade of “C” or better
Course Transferable to CSU
Hours: 162 hours LEC, 162 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. It also includes Bureau of Automotive Repair (BAR) Basic Area Clean Air Course, Enhanced Area Clean Air Course, and BAR Update Courses. This course meets Automotive Service Excellence (ASE) A8 and L1 requirements when AT 312, 314, 315 and 320 are completed.

AT 322 Engine Performance & Electronic Engine Controls 6 Units
Prerequisite: AT 312 and 314 with grades of “C” or better
Course Transferable to CSU
Hours: 72 hours LEC, 108 hours LAB
This course covers the principles, operation, and diagnosis of automotive engine performance systems including engine mechanics, ignition, fuel delivery and electronic engine controls. Instruction includes extensive troubleshooting, use of diagnostic test equipment, lab oscilloscopes, stantools, and emission analyzers. This course meets Automotive Service Excellence (ASE) certification standards for the A8 engine performance certification with completion of AT 323.

AT 323 Clean Air Car Course 6 Units
Prerequisite: AT 322 (Engine Performance & Electronic Engine Controls) with a grade of “C” or better or one year work experience in automotive engine performance
Course Transferable to CSU
Hours: 72 hours LEC, 108 hours LAB
This course covers the Bureau of Automotive Repair (BAR) certified Basic and Advanced Clean Air Car Course, which now includes the former On Board Diagnostics (OBD) II update course, and the BAR 03/04 and 05/06 update courses. Topics include: smog check laws, rules and regulations; exhaust emission analysis; emission control systems diagnosis; smog inspection procedures; digital storage oscilloscopes (DSO) usage; loaded mode emission testing and smog check failure diagnosis. It is required for first-time licensed technicians or for those whose license has been expired for more than one year. This course may be taken four times for credit.

AT 325 Performance Evaluation and Planning 4 Units
Prerequisite: AT 110, 130, 311, 312, and 314 with grades of “C” or better
Advisory: AT 320 and 322
Course Transferable to CSU
Hours: 54 hours LEC, 54 hours LAB
This course explores the performance and efficiency of the modern vehicle power-train. Course topics include performance and economy modifications through systematic testing procedures while maintaining credible results through the use of modern measurement tools. This course may be taken two times on different projects.

AT 327 Advanced Motorsports 4 Units
Prerequisite: AT 110, 130, 311, 312, and 314 with grades of “C” or better
Advisory: AT 130, 313, and 321
Course Transferable to CSU
Hours: 54 hours LEC, 54 hours LAB
This course is an introduction to motorsports through lecture and raceway experience. It covers real time operation of a race team, racing events, and race track operation. Field trips may be required. This course may be taken two times on different projects.