



El Camino College  
COURSE OUTLINE OF RECORD – Official

<b>Course Acronym:</b>	ATEC
<b>Course Number:</b>	27
<b>Descriptive Title:</b>	BAR Level I Smog Check Inspector Training
<b>Division:</b>	Industry and Technology
<b>Department:</b>	Automotive Technology
<b>Course Disciplines:</b>	Automotive Technology
<b>Catalog Description:</b>	This course covers the California Bureau of Automotive Repair (BAR) Level I course content training requirements for California Smog Check Inspector candidates. Successful completion of this course partially satisfies the education requirements for the state Smog Check Technicians License. It is highly recommended that students entering into this course have one year experience/education in the automotive engine performance area. This course covers the study of proper procedures for inspection, testing, repair, and certification of vehicle emissions within California Clean Air Car Standards. Emphasis is placed on Bureau of Automotive Repair (BAR) Rules and Regulations, BAR Emission Inspection System operation procedures, On-board Diagnostics Generation II (OBD II) operation and O <sub>2</sub> /Air Fuel Sensor Testing.
<b>Prerequisite:</b>	
<b>Co-requisite:</b>	
<b>Recommended Preparation:</b>	8 units from the following courses: Automotive Technology 21, Automotive Technology 22A, Automotive Technology 22B, Automotive Technology 23, Automotive Technology 24, Automotive Technology 25 or equivalent trade experience.
<b>Enrollment Limitation:</b>	
<b>Hours Lecture (per week):</b>	3.5
<b>Hours Laboratory (per week):</b>	1.5
<b>Outside Study Hours:</b>	7
<b>Total Course Hours:</b>	90
<b>Course Units:</b>	4
<b>Grading Method:</b>	Letter Grade only
<b>Credit Status:</b>	Credit, degree applicable
<b>Transfer CSU:</b>	Yes
<b>Effective Date:</b>	Prior to July 1992
<b>Transfer UC:</b>	No
<b>Effective Date:</b>	
<b>General Education: ECC</b>	
<b>Term:</b>	

<b>Other:</b>	
<b>CSU GE:</b>	
<b>Term:</b>	
<b>Other:</b>	
<b>IGETC:</b>	
<b>Term:</b>	
<b>Other:</b>	
<b>Student Learning Outcomes:</b>	<p><b>SLO #1 Safety</b></p> <p>Given an in class exam, based on readings, classroom discussions and demonstrations, the student will be able to work in the Automotive Shop safely and pass the Automotive Safety Exam with 100% accuracy.</p> <p><b>SLO #2 Engine Theory and Operation</b></p> <p>Describe engine theory, design and operation of both gasoline vehicles and diesel vehicles.</p> <p><b>SLO #3 Engine Systems and Components</b></p> <p>Demonstrate knowledge and ability to identify engine system and components.</p>
<b>Course Objectives:</b>	<ol style="list-style-type: none"> <li>1. Score 100% accuracy on a safety test.</li> <li>2. Identify emission control components and related systems.</li> <li>3. Explain the operation of emission controls and related systems.</li> <li>4. Identify the function of emission controls and their function in controlling pollutants.</li> <li>5. Identify and explain the California smog check program rules and regulations.</li> <li>6. Operate, enter data, and maintain the Emission Inspection System (EIS).</li> <li>7. Identify vehicles and emission control systems using underhood labels, reference manuals, and also the Smog Check Manual covering requirements for gray market vehicles, engine changes, and preparation of written estimate.</li> <li>8. Test and evaluate the exhaust emissions of motor vehicles and explain the relationship of exhaust emissions and performance of the motor vehicle.</li> <li>9. Properly operate test equipment, precondition the vehicle and test the emissions of motor vehicles under program guidelines.</li> <li>10. Interpret test results, diagnose cause of failures, and prescribe needed adjustments and repairs of motor vehicles.</li> <li>11. Locate, test, and evaluate emission controls on vehicles with on-board computers.</li> <li>12. Precondition and test emissions on vehicles with on-board computers.</li> <li>13. Interpret test results, diagnose cause of failure, and prescribe needed adjustments and repairs.</li> </ol>
<b>Major Topics:</b>	<p><b>I. Overview of BAR Level I smog training and safety (3.5 hours, lecture)</b></p> <ol style="list-style-type: none"> <li>A. Scope of course</li> <li>B. Course requirements</li> <li>C. Safety information</li> <li>D. Personal safety</li> <li>E. Shop safety</li> </ol>

- F. Equipment safety
- G. Vehicle safety and safety test

**II. Overview of BAR Level I smog training and safety (1.5 hours, lab)**

- A. Scope of course
- B. Course requirements
- C. Safety information
- D. Personal safety
- E. Shop safety
- F. Equipment safety
- G. Vehicle safety and safety test

**III. Engine theory, design, and operation of gasoline and diesel engines (10.5 hours, lecture)**

- A. Types of engines
- B. Cooling systems
- C. Exhaust systems
- D. Electrical systems

**IV. Engine theory, design, and operation of gasoline and diesel engines (4.5 hours, lab)**

- A. Types of engines
- B. Cooling systems
- C. Exhaust systems
- D. Electrical systems

**V. Engine performance of gasoline and diesel engines (17.5 hours, lecture)**

- A. Ignition systems
- B. Induction systems
- C. Fuel Metering systems: fuel injection and carburetion
- D. Engine management
- E. On Board Diagnostic (OBD) systems

**VI. Engine performance of gasoline and diesel engines (7.5 hours, lab)**

- A. Ignition systems
- B. Induction systems
- C. Fuel metering systems: fuel injection and carburetion
- D. Engine management
- E. OBD systems

**VII. OBD and OBD II system operation (10.5 hours, lecture)**

- A. OBD systems
- B. OBDII system operation and diagnostics
- C. Use of On Board Diagnostics Generation I (OBDI) and OBDII scan tools

**VIII. OBD and OBD II system operation (4.5 hours, lab)**

	<ul style="list-style-type: none"> <li>A. OBD Systems</li> <li>B. OBDII system operation and diagnostics</li> <li>C. Use of OBDI and OBDII scan tools</li> </ul> <p><b>IX. Emission control systems for gasoline and diesel engines (21 hours, lecture)</b></p> <ul style="list-style-type: none"> <li>A. Crankcase emission controls</li> <li>B. Evaporative emission controls</li> <li>C. Thermostatic air cleaners</li> <li>D. Air injection systems</li> <li>E. Ignition spark controls</li> <li>F. Exhaust after treatment systems</li> <li>G. Exhaust gas recirculation systems</li> </ul> <p><b>X. Emission control systems for gasoline and diesel engines (9 hours, lab)</b></p> <ul style="list-style-type: none"> <li>A. Crankcase emission controls</li> <li>B. Evaporative emission controls</li> <li>C. Thermostatic air cleaners</li> <li>D. Air injection systems</li> <li>E. Ignition spark controls</li> <li>F. Exhaust after treatment systems</li> <li>G. Exhaust gas recirculation systems</li> </ul>
<b>Total Lecture Hours:</b>	63
<b>Total Laboratory Hours:</b>	27
<b>Total Hours:</b>	90
<b>Primary Method of Evaluation:</b>	Skills demonstration
<b>Typical Assignment Using Primary Method of Evaluation:</b>	Prepare a one-page written report evaluating an automotive emission control system. Submit report to the instructor for evaluation.
<b>Critical Thinking Assignment 1:</b>	Analyze data from a vehicle smog check. Use diagnostic information and a diagnostic report to determine recommended repairs, parts and labor needed for vehicle repair according to manufacturer's specifications. Report findings on a one-page report and submit to the instructor for evaluation.
<b>Critical Thinking Assignment 2:</b>	Perform a smog pretest and component inspection. Complete a one-page diagnostic worksheet describing pass or fail results of smog inspection and write an explanation of the reasons the vehicle passed or failed the smog inspection. Submit worksheet to the instructor for evaluation.
<b>Other Evaluation Methods:</b>	Class Performance Homework Problems Laboratory Report Multiple Choice Other Exams Performance Exams Quizzes True/False Written Homework

<b>Instructional Methods:</b>	Demonstration Discussion Lab Lecture Multimedia presentations
<b>If other:</b>	Collaborative Learning Workbooks
<b>Work Outside of Class:</b>	Answer questions Problem solving activity Required reading Study Written work (such as essay/composition/report/analysis/research)
<b>If Other:</b>	
<b>Up-To-Date Representative Textbooks:</b>	James Halderman. <u>Automotive Engine Performance</u> , 5th edition, Pearson, 2017 (Discipline Standard)  Bureau of Automotive Repair. <u>Write It Right Book</u> . Bureau of Automotive Repair, 2019.  Bureau of Automotive Repair. <u>Smog Check Inspection Procedures Manual</u> . Bureau of Automotive Repair, 2017. (Discipline Standard)  Bureau of Automotive Repair. <u>Smog Check Reference Guide</u> . Bureau of Automotive Repair, 2018.  Bureau of Automotive Repair. <u>Laws and Regulations Manual</u> . Bureau of Automotive Repair, 2014. (Discipline Standard)
<b>Alternative Textbooks:</b>	
<b>Required Supplementary Readings:</b>	Shop manuals
<b>Other Required Materials:</b>	Three ring binder notebook and paper  Pen and pencil  Safety glasses  Shop safe clothing
<b>Requisite:</b>	
<b>Category:</b>	
<b>Requisite course(s): List both prerequisites and corequisites in this box.</b>	
<b>Requisite and Matching skill(s):Bold the requisite skill. List the corresponding course objective under each skill(s).</b>	
<b>Requisite Skill:</b>	

<p><b>Requisite Skill and Matching Skill(s): Bold the requisite skill(s). If applicable</b></p>	
<p><b>Requisite course:</b></p>	<p>8 units from the following courses:</p> <p>Automotive Technology-21</p> <p>Automotive Technology-22A</p> <p>Automotive Technology-22B</p> <p>Automotive Technology-23</p> <p>Automotive Technology-24</p> <p>Automotive Technology-25</p>
<p><b>Requisite and Matching skill(s):Bold the requisite skill. List the corresponding course objective under each skill(s).</b></p>	<p><b>Ability to demonstrate shop safety practices.</b></p> <p>ATEC 21- Complete a safety test with 100% accuracy.</p> <p>ATEC 22A - Score 100% accuracy on a safety test.</p> <p>ATEC 23 - Demonstrate 100% accuracy on a safety test.</p> <p><b>Ability to identify engine components.</b></p> <p>ATEC 21 - Distinguish engine components</p> <p>ATEC 22A - Identify engine components.</p> <p>ATEC 23 - Distinguish between various engine components.</p> <p><b>Ability to identify ignition system components.</b></p> <p>ATEC 21 - Distinguish ignition components.</p> <p>ATEC 22A - Identify ignition components.</p> <p>ATEC 25 - Diagnose and repair ignition systems.</p> <p><b>Ability to identify fuel system components.</b></p> <p>ATEC 21- Evaluate, test and service fuel systems.</p> <p>ATEC 22A - Evaluate, service, test, and repair fuel systems.</p> <p>ATEC 22B - Evaluate, test, diagnose and repair fuel injection systems.</p> <p>ATEC 24 - Distinguish computer controlled fuel system components.</p>

	<p><b>Ability to identify emission system components.</b></p> <p>ATEC 21 - Evaluate, test, and service emission control systems.</p> <p>ATEC 22A - Evaluate, service, test, and repair emission control systems.</p> <p>ATEC 22B - Evaluate and test an emission system.</p> <p>ATEC 23 - Distinguish emission control components.</p> <p>ATEC 24 - Diagnose and repair emission control systems.</p> <p><b>Ability to connect and operate a scan tool and read/evaluate data.</b></p> <p>ATEC 22A - Test and evaluate engine condition and performance using an engine analyzer/scanner.</p> <p>ATEC 22B - Evaluate, test, diagnose and repair computer controlled systems.</p> <p>ATEC 25 - Diagnose and repair computer controlled systems.</p>
<b>Requisite Skill:</b>	or equivalent trade experience
<b>Requisite Skill and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s). If applicable</b>	If students possess ASE A-6 and A-8 certification, they will be prepared to enroll in this course.
<b>Enrollment Limitations and Category:</b>	
<b>Enrollment Limitations Impact:</b>	
<b>Course Created by:</b>	John Lewis
<b>Date:</b>	09/01/1990
<b>Original Board Approval Date:</b>	02/11/1991
<b>Last Reviewed and/or Revised by:</b>	Michael Anderson
<b>Date:</b>	03/22/2022
<b>Last Board Approval Date:</b>	1/17/2023