I. GENERAL COURSE INFORMATION

Subject and Number: Automotive Technology 27
Descriptive Title: BAR Level I Smog Check Inspector Training
Course Disciplines: Automotive Technology
Division: Industry and Technology

Catalog Description:
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, OBDII operation and O2 /Air Fuel Sensor Testing.

Conditions of Enrollment:
Recommended Preparation: 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.

Course Length: X Full Term Other (Specify number of weeks):
Hours Lecture: 4.00 hours per week TBA
Hours Laboratory: 1.00 hours per week TBA
Course Units: 4.00

Grading Method: Letter
Credit Status: Associate Degree Credit

Transfer CSU: X Effective Date: Prior to July 1992
Transfer UC: No

General Education:
El Camino College:
CSU GE:
IGETC:

II. OUTCOMES AND OBJECTIVES

A. COURSE STUDENT LEARNING OUTCOMES (The course student learning outcomes are listed below, along with a representative assessment method for each. Student learning outcomes are not subject to review, revision or approval by the College Curriculum Committee)

1. 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.

2. Describe engine theory, design and operation of both gasoline vehicles and diesel vehicles.

3. Demonstrate knowledge and ability to identify engine system and components.

The above SLOs were the most recent available SLOs at the time of course review. For the most current SLO statements, visit the El Camino College SLO webpage at http://www.elcamino.edu/academics/slo/.

B. Course Student Learning Objectives (The major learning objective for students enrolled in this course are listed below, along with a representative assessment method for each)

1. Score 100% accuracy on a safety test.
   - Objective Exams
2. Identify emission control components and related systems.
   - Laboratory Reports
3. Explain the operation of emission controls and related systems.
   - Objective Exams
4. Identify the function of emission controls and their function in controlling pollutants.
   - Written Homework
5. Identify and explain the California smog check program rules and regulations.
   - Written Homework
6. Operate, enter data, and maintain the Emission Inspection System (EIS).
   - Laboratory Reports
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.
   - Laboratory Reports
8. Test and evaluate the exhaust emissions of motor vehicles and explain the relationship of exhaust emissions and performance of the motor vehicle.
   - Laboratory Reports
9. Properly operate test equipment, precondition the vehicle and test the emissions of motor vehicles under program guidelines.
   - Laboratory Reports
10. Interpret test results, diagnose cause of failures, and prescribe needed adjustments and repairs of motor vehicles.
    - Laboratory Reports
11. Locate, test, and evaluate emission controls on vehicles with on-board computers.
    - Laboratory Reports
12. Precondition and test emissions on vehicles with on-board computers.
    - Laboratory Reports
13. Interpret test results, diagnose cause of failure, and prescribe needed adjustments and repairs.
    - Laboratory Reports

III. OUTLINE OF SUBJECT MATTER (Topics are detailed enough to enable a qualified instructor to determine the major areas that should be covered as well as ensure consistency from instructor to instructor and semester to semester.)

Lecture or Lab	Approximate Hours	Topic Number	Major Topic
Lecture	4	I	OVERVIEW OF BAR LEVEL I SMOG TRAINING AND SAFETY 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
Lab	1	II	OVERVIEW OF BAR LEVEL I SMOG TRAINING AND SAFETY 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
Lecture	12	III	ENGINE THEORY, DESIGN AND OPERATION GASOLINE AND DIESEL ENGINES A. Types of Engines B. Cooling Systems C. Exhaust Systems D. Electrical Systems
Lab	3	IV	ENGINE THEORY, DESIGN AND OPERATION GASOLINE AND DIESEL ENGINES A. Types of Engines B. Cooling Systems C. Exhaust Systems D. Electrical Systems
Lecture	20	V	ENGINE PERFORMANCE GASOLINE AND DIESEL ENGINES A. Ignition Systems B. Induction Systems C. Fuel Metering Systems: Fuel Injection and Carburetion D. Engine Management E. On Board Diagnostic Systems

Lab	5	VI	ENGINE PERFORMANCE GASOLINE AND DIESEL ENGINES A. Ignition Systems B. Induction Systems C. Fuel Metering Systems: Fuel Injection and Carburetion D. Engine Management E. On Board Diagnostic Systems
Lecture	12	VII	ON-BOARD DIAGNOSTICS and ON-BOARD DIAGNOSTIC II (OBDII) SYSTEM OPERATION A. On Board Diagnostic Systems B. OBDII system operation and diagnostics C. Use of OBDI and OBDII scan tools
Lab	3	VIII	ON-BOARD DIAGNOSTICS OBDII SYSTEM OPERATION A. On Board Diagnostic Systems B. OBDII system operation and diagnostics C. Use of OBDI and OBDII scan tools
Lecture	24	IX	EMISSION CONTROL SYSTEMS FOR GASOLINE AND DIESEL VEHICLES A. Crankcase Emission Controls B. Evaporative Emission Controls C. Thermostatic Air Cleaners D. Air Injection Systems E. Ignition Spark Controls F. Exhaust After Treatment Systems G. Exhaust Gas Recirculation Systems
Lab	6	X	EMISSION CONTROL SYSTEMS FOR GASOLINE AND DIESEL VEHICLES A. Crankcase Emission Controls B. Evaporative Emission Controls C. Thermostatic Air Cleaners D. Air Injection Systems E. Ignition Spark Controls F. Exhaust After Treatment Systems G. Exhaust Gas Recirculation Systems
Total Lecture Hours		72	
Total Laboratory Hours		18	
Total Hours		90	

IV. PRIMARY METHOD OF EVALUATION AND SAMPLE ASSIGNMENTS

A. PRIMARY METHOD OF EVALUATION:

Skills demonstrations

B. TYPICAL ASSIGNMENT USING PRIMARY METHOD OF EVALUATION:

Prepare a one-page written report evaluating an automotive emission control system. Submit report to the instructor for evaluation.

C. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:

1. 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.

2. 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.

D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:

Performance exams
Other exams
Quizzes
Written homework
Laboratory reports
Class Performance
Homework Problems
Multiple Choice
Completion
Matching Items
True/False
Other (specify): COMPLIANCE WITH MANUFACTURER'S SERVICE PROCEDURES

V. INSTRUCTIONAL METHODS

Demonstration
Discussion
Laboratory
Lecture
Multimedia presentations
Other (please specify) Collaborative Learning Workbooks

Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instruction delivery shall provide access, full inclusion, and effective communication for students with disabilities.

VI. WORK OUTSIDE OF CLASS

Study
Answer questions
Required reading
Problem solving activities
Written work

Estimated Independent Study Hours per Week: 8

VII. TEXTS AND MATERIALS

A. UP-TO-DATE REPRESENTATIVE TEXTBOOKS

James Halderman. Automotive Engine Performance, 5th ed. Pearson, 2017.
Bureau of Automotive Repair. Write It Right Book. Bureau of Automotive Repair, 2019.
Bureau of Automotive Repair. Smog Check Inspection Procedures Manual. Bureau of Automotive Repair, 2017.
Bureau of Automotive Repair. Smog Check Reference Guide. Bureau of Automotive Repair, 2018.
Bureau of Automotive Repair. Laws and Regulations Manual. Bureau of Automotive Repair, 2014.
Qualifier Text: INDUSTRY STANDARD

B. ALTERNATIVE TEXTBOOKS

C. REQUIRED SUPPLEMENTARY READINGS

Shop manuals

D. OTHER REQUIRED MATERIALS

Three ring binder notebook and paper
Pen and pencil
Safety glasses
Shop safe clothing

VIII. CONDITIONS OF ENROLLMENT

A. Requisites (Course and Non-Course Prerequisites and Corequisites)

Requisites	Category and Justification

B. Requisite Skills

Requisite Skills

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation	Category and Justification
Course Recommended Preparation Automotive Technology-21	
Course Recommended Preparation Automotive Technology-22A	
Course Recommended Preparation Automotive Technology-22B	
Course Recommended Preparation Automotive Technology-23	

Course Recommended Preparation Automotive Technology-24	
Course Recommended Preparation or Automotive Technology-25	
Non-Course Recommended Preparation Equivalent trade experience	If students possess ASE A-6 and A-8 certification, they will be prepared to enroll in this course.

D. Recommended Skills

Recommended Skills
Ability to demonstrate shop safety practices. ATEC 21- Complete a safety test with 100% accuracy. ATEC 22A - Score 100% accuracy on a safety test. ATEC 23 - Demonstrate 100% accuracy on a safety test. Ability to identify engine components. ATEC 21 - Distinguish engine components ATEC 22A - Identify engine components. ATEC 23 - Distinguish between various engine components. Ability to identify ignition system components. ATEC 21 - Distinguish ignition components. ATEC 22A - Identify ignition components. ATEC 25 - Diagnose and repair ignition systems. Ability to identify fuel system components. ATEC 21- Evaluate, test and service fuel systems. ATEC 22A - Evaluate, service, test, and repair fuel systems. ATEC 22B - Evaluate, test, diagnose and repair fuel injection systems. ATEC 24 - Distinguish computer controlled fuel system components. Ability to identify emission system components. ATEC 21 - Evaluate, test, and service emission control systems. ATEC 22A - Evaluate, service, test, and repair emission control systems. ATEC 22B - Evaluate and test an emission system. ATEC 23 - Distinguish emission control components. ATEC 24 - Diagnose and repair emission control systems. Ability to connect and operate a scan tool and read/evaluate data. ATEC 22A - Test and evaluate engine condition and performance using an engine analyzer/scanner. ATEC 22B - Evaluate, test, diagnose and repair computer controlled systems. ATEC 25 - Diagnose and repair computer controlled systems.

E. Enrollment Limitations

Enrollment Limitations and Category	Enrollment Limitations Impact

Course created by John Lewis on 09/01/1990.

BOARD APPROVAL DATE: 02/11/1991

LAST BOARD APPROVAL DATE: 01/21/2020

Last Reviewed and or Revised by: Michael Anderson Date: October 19, 2019

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