

## CUYAMACA COLLEGE OFFICIAL COURSE OUTLINE

### **AUTOMOTIVE TECHNOLOGY 121 – EMISSION CONTROL LICENSE**

3 hours lecture, 6 hours laboratory, 5 units

#### **Catalog Description**

Theory of operation, repair and maintenance of emission control devices with strong emphasis on laws and regulations required for licensing. Additional training covers: loaded mode dyno testing, NOx failure analysis and diagnostics, OBD II, catalytic converter testing and Oxygen sensor diagnosis with a digital storage oscilloscope (DSO). This course is approved by the State of California Bureau of Automotive Repair (BAR) and includes the Basic and Advanced clean air car courses. Designed to prepare students to take the BAR Advanced Emission Specialist Technician (EA) License test.

#### **Prerequisite**

None

#### **Course Objectives**

Students will be able to:

- 1) Distinguish between safe and unsafe working habits
- 2) Select appropriate service procedures and techniques to test smog devices
- 3) Evaluate appropriate emission control applications for specific vehicles and verify their presence through visual inspections
- 4) Develop the ability to find application, test and repair procedures as they apply to emission control systems utilizing appropriate reference books
- 5) Demonstrate the ability to properly enter data into the emission test analyzer
- 6) Provide training in safe and proper operation of emission dynamometer
- 7) Test vehicles according to Bureau of Automotive Repair (BAR) standards
- 8) Evaluate test results of vehicles that fail inspection and develop a systematic plan for diagnosis of vehicle subsystems to determine the exact cause of inspection failure
- 9) Have a clear understanding of BAR rules and regulations as they pertain to the smog check program

#### **Special Materials Required of Student**

- 1) Basic hand tool set
- 2) Approved safety glasses
- 3) Notebook, required textbook

#### **Minimum Instructional Facilities**

- 1) Classroom with projection screen
- 2) Required training materials
- 3) BAR-97 emission analyzer and dynamometer
- 4) Lab facility (minimum 2 days) for testing of emission components

#### **Course Content**

- 1) Lecture
  - a. Introduction and safety
  - b. Licensing of test and repair stations and technicians
  - c. Certificates of compliance and noncompliance
  - d. Automotive emissions and their cause
  - e. Crankcase emission control devices
  - f. Exhaust emission control system
  - g. Evaporative loss control systems
  - h. Exempted vehicles and fuel conversions
  - i. Introduction to state biennial smog check program
  - j. Testing and repairing computer engine controlled systems

- k. OBD II
- l. NOx failure diagnosis
- 2) Lab
  - a. Perform visual inspections of emission control systems
  - b. Perform repairs and operational tests of emission control systems
  - c. Perform emission control tests using loaded mode dynamometer and emission analyzer
  - d. Perform OBD II and NOx diagnosis testing
  - e. Diagnose catalytic converters for degradation and/or failure
  - f. Diagnose Oxygen sensors with Digital Storage Oscilloscope (DSO)

**Method of Instruction**

- 1) Lecture and discussion
- 2) Demonstration
- 3) Individual assistance

**Method of Evaluation**

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.

- 1) Quizzes and written exams
- 2) Observation of student work
- 3) Hands-on performance exam

**Texts and References**

- 1) Required: Various publications as required by the BAR
- 2) Supplemental: None