

CUYAMACA COLLEGE OFFICIAL COURSE OUTLINE

AUTOMOTIVE TECHNOLOGY 194 – ASSET – TUNE-UP AND EMISSIONS

5 hours lecture, 6 hours laboratory, 7 units

Catalog Description

Ford ASSET course to include an in-depth study of tune-up and emission systems, beginning with a review of basic engine systems followed by a detailed study of tune-up and emission system diagnostic and repair procedures utilizing state of the art equipment. Includes the State of California Bureau of Automotive "120 Hour Clean Air Car Course," which fulfills requirements to enable students to take the State of California test for smog technicians. Preparation for ASE Certification. Complemented by required work experience in the dealership.

Prerequisite

None

Course Objectives

Students will be able to:

- 1) Acquire safe working habits
- 2) Relate theory of engine systems to practical diagnostic application
- 3) Independently demonstrate ability to perform tune-up and repair operations using related diagnostic equipment
- 4) Be acquainted with service techniques used in testing smog devices
- 5) Make accurate visual inspections of various makes of vehicles
- 6) Develop the ability to find application, test and repair procedures as they apply to emission control systems utilizing appropriate reference books
- 7) Properly enter data into the emissions analyzer and perform actual smog inspections to industry standards

Special Materials Required of Student

- 1) Mechanic's hand tool set
- 2) Approved safety glasses
- 3) Specialized engine tune-up tools

Minimum Instructional Facilities

- 1) Auto tech lab (6 bays)
- 2) Complete tune-up and diagnostic equipment center
- 3) Various training models
- 4) Training vehicles
- 5) Classroom with projection screen
- 6) Automotive transparencies, filmstrips

Course Content

- 1) Lecture:
 - a. Introduction and safety
 - b. Engine fundamentals
 - c. Engine measurement and diagnosis
 - d. Basic electrical principles
 - e. Ignition system operation, testing and servicing
 - f. Cooling system operation and servicing
 - g. Fuel system operation and service
 - h. Tune-up procedures
 - i. Oscilloscope function and operation
 - j. Dynamometer operation
 - k. Fuel injection
 - l. Computerized "closed-loop" engine control
 - m. Solid-state electronics

- n. Licensing of test and repair stations and technicians
 - o. Automotive emissions and their causes
 - p. Crankcase and exhaust emission control systems
 - q. Add-on devices
 - r. Exempted vehicles and fuel conversions
 - s. Introduction to State Biennial Smog Check program
 - t. Testing and repairing computer-controlled engine systems
- 2) Lab:
- a. Introduction and safety
 - b. Laboratory procedures
 - c. Equipment operation
 - d. Cooling system diagnosis and repair
 - e. Fuel system trouble shooting and repair
 - f. Ignition system trouble shooting and repair
 - g. Tune-up procedures
 - h. Valve adjustment
 - i. Locating and testing various sensors on vehicles
 - j. Adjusting computer carburetors to specification
 - k. Diagnosing computer related malfunctions
 - l. Servicing fuel injection systems
 - m. Performing visual inspection of emission control systems
 - n. Performing repairs and operational tests of emission control systems
 - o. Performing emission control tests using infrared emission analyzer

Method of Instruction

- 1) Lecture and demonstration
- 2) 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, exams (multiple choice, fill-in, true-false, short essay)
- 2) Observation of student work
- 3) Inspection of work completed
- 4) Hands-on performance exam

Texts and References

- 1) Required: None
- 2) Supplemental: None