

CUYAMACA COLLEGE

OFFICIAL COURSE OUTLINE

AUTOMOTIVE TECHNOLOGY 129 – INTRODUCTION TO ALTERNATIVE FUELS

3 hours lecture, 1.5 hours laboratory, 3.5 units

Catalog Description

Introductory course in the study of alternative fuels and their delivery systems for automotive and light truck application. The main focus will be centered around Compressed Natural Gas (CNG) and Liquefied Petroleum Gas (LPG) systems. Additionally, electric, hybrid and fuel cell technologies will be discussed. Topics include: environmental concerns, pros and cons of various alternative fuel options, properties and chemical structure of various alternative fuels, safety aspects of each fuel, fuel storage, fuel metering control, retrofitting, installation, and diagnosis and troubleshooting. Recommended that students have a working knowledge of automotive electricity, automotive tune-up and diagnosis, and automotive computer systems.

Prerequisite

None

Course Objectives

Students will be able to:

- 1) Acquire safe working habits
- 2) Develop a working knowledge of alternative fuels and delivery systems
- 3) Comprehend the pros and cons of various alternative fuels for automotive application
- 4) Satisfactorily install a retrofit fuel system on a vehicle
- 5) Accurately diagnose fuel supply, delivery and electronic control systems

Special Materials Required of Student

- 1) Mechanic's hand tool set
- 2) Approved safety glasses

Minimum Instructional Facilities

Auto tech lab (6 bays)

Course Content

- 1) Lecture:
 - a. Introduction to alternative fuels
 - b. Political and economic implications
 - c. Advantages and disadvantages of each fuel
 - d. Properties and chemical structure of each fuel
 - e. Safety
 - f. Fuel storage and handling
 - g. Fuel metering control: carburetion and fuel injection
 - h. Retrofitting existing gasoline system
 - i. Selecting appropriate retrofit system
 - j. System installation
 - k. Diagnosis and troubleshooting
- 2) Lab:
 - a. Introduction and safety
 - b. Fuel storage and handling
 - c. Selecting vehicle and appropriate retrofit systems
 - d. Installation and inspection of fuel tanks and lines
 - e. Installation of carburetor/fuel injection components
 - f. Installation of computer controller and related wiring
 - g. Diagnosis and troubleshooting

Method of Instruction

- 1) Lecture and demonstration
- 2) Individual and group 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.

Texts and References

- 1) Required: To be selected by instructor
- 2) Supplemental: None