PALOMAR COLLEGE
COURSE OUTLINE OF RECORD FOR
DEGREE CREDIT COURSE

____ Transfer Course _x_ A.A. Degree applicable course
(check all that apply)

COURSE NUMBER AND TITLE: DMT 56 Alternative Fuels

UNIT VALUE: 3

MINIMUM NUMBER OF SEMESTER HOURS: 96

BASIC SKILLS REQUIREMENTS: Appropriate language and computational skills.

ENTRANCE REQUIREMENTS

PREREQUISITE: None

COREQUISITE: None

RECOMMENDED PREPARATION: DMT 50

SCOPE OF COURSE:

Theory of servicing of alternative fueled engines. Topics for study include various types of fuels, fuel handling and safety procedures, basic principles, regulators and mixers, all system components operation and service, electronic control systems and emission testing.

SPECIFIC COURSE OBJECTIVES:

The Student will be able to:

1. Identify various types of alternative fuel and their physical and chemical properties.
2. Define the internal combustion process.
3. Identify fuel handling and safety procedures.
4. Identify operation, function and servicing, electronic control systems and emission testing.

CONTENT IN TERMS OF SPECIFIC BODY OF KNOWLEDGE:

I. Various Types of Alternative Fuels
   A. LPG
   B. CNG
   C. LNG

D. Methanol
E. Ethanol

II. Internal Combustion Process
A. Cycle Operation
B. Fuel/Air Mixing (Ratio)

III. Fuel Handling and Safety Procedure
A. Filling Procedures
B. Safety Equipment
C. Leak Testing
D. Shop Safety Equipment

IV. Operation, Function, and Service of System Components
A. Storage Cylinder
B. Cylinder Valves
C. Pressure relief Devices
D. Steel Lines
E. Pressure Regulators
F. Air Fuel Mixers
G. Electronic Components

V. Exhaust Emission
A. CNG Emission
B. Hydrocarbons (HC)
C. Carbon Monoxide (CO)
D. Nitrogen Oxides (NOx)
E. Carbon Dioxide (CO_2)
F. Emission Measurements and Testing
G. Emission Standards

REQUIRED READING:

No textbook is available for this "new" technology at this time. (OEM Manuals only).

SUGGESTED READING:

Service and reference manual from original equipment manufacturers (OEM).

REQUIRED WRITING:

Each student must maintain a classroom/lab notebook with handouts and sketches of alternative fuel system. Write a two-page report on completion of outside assignment.

OUTSIDE ASSIGNMENTS:

Students are expected to spend a minimum of three hours per unit per week in class and on outside assignments, prorated for short-term classes.

Each student must visit a fleet that operates equipment with alternative fuel, observe their service procedures and write a two-page report.

INSTRUCTIONAL METHODOLOGY:

Check all that apply:

_____ lecture
_____ laboratory
_x_ lecture-laboratory combination
_____ directed study

DISTANCE LEARNING:

This course may be offered as a distance learning course and meets Title 5 regulations 55370, 55372, 55374, 55376, 55378, and 55380.
Yes ____ No_X__

If yes, check all that apply:

_____ Television Course (Video one-way, e.g. ITV, video cassette, etc.)
_____ Online Course (Text one-way, e.g. newspaper, correspondence, electronic file, etc.)
_____ Two-Way Video Conferencing (Two-way interactive video and audio)
_____ One-Way Video Conferencing (One-way interactive video and two-way interactive audio)
_____ Computer Assisted Instruction (A specialized form of mediated instruction relying primarily on student access to information and prepared lessons or teaching materials through a computer terminal, but not under immediate supervision of a qualified instructor.)

GRADING POLICY AND STANDARDS (include methods of determining whether the stated objectives have been met by students):

40% Unit Exams
40% Laboratory Performance
10% Class Participation
10% Outside Assignment

IS COURSE REPEATABLE FOR REASON (S) OTHER THAN DEFICIENT GRADE?
Yes ____ No _X_ Number of times course may be taken for credit: _1__

If yes, identify specific provision of Title 5 Division 2 section(s), 55761-55763 and 58161 which qualifies course as repeatable: 58161©(2)(A)

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SIGNATURES ON FILE