San Bernardino Valley College
Curriculum Approved: September 13, 2004

I. COURSE INFORMATION:

Department Information:

Division:	Transportation
Department:	Diesel
Course ID:	DIESEL 034
Course Title:	Introduction to Heavy Duty Compressed Natural Gas Vehicle Systems
Units:	2
Lecture:	1.5 Hours
Laboratory:	1.5 Hours
Prerequisite:	DIESEL 026

Catalog and Schedule Description: This course provides theory and hands-on experience in the operation, service, inspection, and maintenance of compressed natural gas (CNG) systems. This course prepares students for ASE Alternate Fuels Test (F-1).

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One

III. EXPECTED OUTCOMES FOR STUDENTS:

Upon successful completion of the course, the student should be able to:

A. Analyze the nature and behavior of (CNG).
B. Distinguish the basic components of (CNG) fuel systems and explain their operation.
C. Describe the use of (CNG) fuel systems tools and equipment.
D. Evaluate service, repair, install and adjust the basic components in the (CNG) fuel systems.
E. Display safe work habits and knowledge of industry safety standards.

IV. CONTENT:

A. Introduction:
    1. Safety
    2. Hazardous materials safety procedures
B. Review basic engine operation
    1. Principles of combustion
    2. Principles of ignition systems.
C. Regulation and regulatory agencies control, handling, use and transportation of (CNG).
    1. Department of Transportation (DOT)
    2. National Transportation Safety Board (NTSB)
    3. Other federal agencies
    4. State Regulation
    5. National fire protection agency
D. Nature and properties of gaseous fuel system components and their operation
E. Identification and explanation of basic gaseous fuel system components and their operation
    1. Fuel storage cylinders
    2. Fuel system plumbing
    3. Valving and controls
    4. Pressure regulators
    5. Auxiliary systems

F. Computer control systems (general)
G. Service, Repair and Adjustment: Troubleshooting

V. METHODS OF INSTRUCTION:

The methods of instruction include, but are not limited to:

A. Lecture and direct laboratory demonstration by instructor
B. Guided laboratory practice by the learner and presentations and demonstrations by field experts

VI. TYPICAL ASSIGNMENTS:

A. Reading textbook and technical manuals
   Typical homework question: What regulatory agencies control transportation of CNG?
B. Hands-on laboratory assignment
C. Calculation involving (CNG) principles
D. Completion of NATEF Task list. Demonstrate the steps involved in draining natural gas out of a storage container.

VII. EVALUATION(S):

A. Methods of evaluation
   1. Multiple choice tests
   2. Completion of NATEF Task list
   3. Examinations
B. Frequency of evaluation: Weekly assignments
C. One mid term examination
   Typical mid term or final test question:
   1. Which of the answers below is correct?
      a) Fuel storage containers can be either stainless or carbon filter.
      b) Fuel storage containers can be steel or brass.
      c) Fuel storage containers can be lead-lines steel or plastic.
      d) None of the above
   2. Outline the proper safety steps when a (compressed natural gas) leak is found.
      a) Step one ----------.
      b) Step two ----------.
      c) Step three ----------.
      d) Step four ----------.
D. One final examination

VIII. TYPICAL TEXT(S):

Messr, Colin. Medium and Heavy – Duty Gaseous Fuels Engines and Fuel Systems (2001). Palm Desert, CA and Morgantown, WV: College of the Desert and West Virginia University, 2001.

IX. OTHER SUPPLIES REQUIRED OF STUDENT: Safety glasses and three ring binder