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Course Outline for NAUT L1L2

SMOG LEVEL ONE AND LEVEL TWO

Effective: Fall 2020

I. CATALOG DESCRIPTION:
NAUT L1L2 — Noncredit

This course includes classes/modules the State of California's requires for a student/automotive technician to be prepared to take their Smog License Test. This class will include Level One and Level Two smog training only. At the end of the class students may or may not qualify for either EI or EO smog license. See www.smogcheck.ca.gov for more information.

Grading Methods:
Letter or P/NP

Discipline:
- Automotive Technology

Noncredit Category
J - Workforce Preparation

	MIN
Total Noncredit Hours:	117.00

II. PREREQUISITE AND/OR ADVISORY SKILLS:

III. MEASURABLE OBJECTIVES:

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

A. Incorporate the concepts, techniques, principles, and legal requirements of the California Smog Check Program, including changes and updates published in the latest edition of the Smog Check Manual;
B. Analyze a vehicle with emission control problems to a criterion established by the instructor based on Bureau of Automotive Repair and industry standards by using the newest in automotive and emission control theory;
C. Analyze vehicle emission systems applications for theory, operation and diagnosis, to a standard set by the Bureau of Automotive Repair, through manipulative, oral, or written assignments, and/or class discussion;
D. Demonstrate proper operating procedures and safety precautions using a 5-Gas Analyzer to conduct a complete smog inspection;
E. Apply automotive computer system theory to evaluate, diagnose, and repair an emissions malfunction caused by a component of the computer system;
F. Perform advanced diagnostic and repair procedures on vehicles equipped with 2nd Generation On Board Diagnostics (OBD II using the latest electronic interface equipment;
G. Discuss and apply the operating theory of wide band oxygen sensor by interpreting scan tool data and the ion transfer between platinum zirconium electrodes.
H. Analyze and diagnose a vehicle with emission control problems, including NOx problems, to a criterion established by the instructor based on Bureau of Automotive Repair and industry standards
I. Demonstrate setup and operation of diagnostic and testing equipment including but not limited to Digital Storage Oscilloscope, BAR97 smog machine, and a dynamometer. Explain results obtained during operation of said equipment.
J. Demonstrate loaded mode emissions base lining techniques and use of diagnostic flow charts
K. Explain catalytic converter theory, operation, and efficiency testing procedures
L. Explain and demonstrate the differences in emissions testing procedures between the BAR90 and the BAR97 gas analyzer systems including dynamometer use of the Enhanced Smog Check Program
M. Perform 5 gas diagnostics
N. Explain the rules and regulations guiding the smog check program and technician duties

IV. CONTENT:
A. The Level One Course is divided into seven parts called modules which correspond with the State Examination modules:
   1. Rules and Regulations
   2. Automotive Theory
   3. Emission Control Theory and Operations
   4. Vehicle Emission Systems Applications
   5. TAS Operation and Testing Procedures
   6. Computer Systems Theory
   7. Diagnosis and Repair of Computerized Vehicles
B. The OBD II Training covers advanced diagnostic and repair procedures on 2nd Generation On Board Diagnostics (OBD II vehicles using the latest electronic interface equipment.
C. Monitor setting and training
D. Five gas training
E. Emission system diagnosis
F. The 2003 Update Course covers smog testing procedures and new rules and regulations in the latest Smog Check Manual.
G. The 2005 Update course covers wide band oxygen sensors testing and theory

H. The 2007 Update course covers catalytic converter testing and theory.
I. The 2011 Update course covers wide band oxygen sensors testing and theory
J. Level Two training including Dynomometer usage, State computer usage, laws and regulations.
K. BAR specified Diagnostic and Repair Training
L. DAD training and requirements
M. Any new content the State of California Smog training requires.

V. METHODS OF INSTRUCTION:
A. **Lecture** -
B. **Lab** - Hands-On lab exercises
C. **Audio-visual Activity** -
D. **Discussion** -

VI. TYPICAL ASSIGNMENTS:
A. Read each module in the text and be prepared to seek clarification and ask questions in class.
B. Orally discuss the material covered in each module.
C. Complete the review questions for each module in the student workbook.
1. (Example) Base spark advance is calculated using what 2 inputs?
2. (Example) True or False? Potentiometers are used to measure throttle position.
D. Complete the related lab exercises for each (relevant) module.
1. (Example) Customize an engine diagnostic scanner for troubleshooting purposes.
2. (Example) Perform a complete Smog Check inspection on at least two computer controlled vehicles, one foreign and one domestic.

VII. EVALUATION:
Methods/Frequency

A. Exams/Tests
One final from State of California
B. Quizzes
Weekly
C. Lab Activities
Weekly
D. Other
1. Passing final exam with a minimum of 70% correct;
2. Demonstrating competency when performing required lab assignments;
3. Meeting mandatory attendance criteria;

VIII. TYPICAL TEXTS:

1. Halderman, James. *ASE Test Preparation and Study Guide.* 2 ed., Pearson, 2017.
2. Bureau of Automotive Repair *Clean Air Car Course Training Manual.*, Department of Consumer Affairs, 1993.
3. Bureau of Automotive Repair *Clean Air Car Course Student Workbook.*, Department of Consumer Affairs, 1993.
4. State of California. *Smog Check Inspection Manual.* 2017 ed., Department of Consumer Affairs, 2017.
5. Bureau of Automotive Repair *Write It Right.*, Department of Consumer Affairs, 1999.
6. Bureau of Automotive Repair *Laws and Regulation.*, Department of Consumer Affairs, 2004.
7. Maurseth, M., E. K. Smith *BD II Generic On-Board Diagnostic Second Generation.*, California Institute of Automotive Technology , 2009.
8. https://www.bar.ca.gov/pdf/2017_Smog_Check_Manual.pdf

IX. OTHER MATERIALS REQUIRED OF STUDENTS:
A. Safety Glasses