

Course Outline for NAUT CA7

CONCEPTS OF AUTOMOTIVE HEATING AND AIR CONDITIONING

Effective: Fall 2021

I. CATALOG DESCRIPTION:
 NAUT CA7 — Noncredit

This class is lecture only and non-credit. Diagnosing, evaluation, testing, adjustment, and repair of heating, ventilation and air conditioning (HVAC). Includes heat and energy, psychometrics, air flow, refrigerant recycling, equipment and controls. Student will be prepared to pass a nationally recognized HVAC certificate program, required by all California HVAC repair shops.

Grading Methods:

Pass/No Pass

Discipline:

- Automotive Technology

Noncredit Category

I - Short-Term Vocational

	MIN
Total Noncredit Hours:	36.00

II. PREREQUISITE AND/OR ADVISORY SKILLS:

III. MEASURABLE OBJECTIVES:

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

- A. Obtain and interpret Service Information, Tools, Safety;
- B. Chart, inspect, and test computerized HVAC control system sensors, HVAC control module, actuators, and circuits using a digital-multi-meter (DMM) on board diagnostic scan tool, and perform necessary action;
- C. Access and use service information to perform step-by-step diagnosis;
- D. Diagnose malfunctions of vacuum and motor driven mode door;
- E. Pass HVAC certification test;
- F. Outline hazardous waste handling;

IV. CONTENT:

- A. Service Information, Tools and Safety
- B. Environmental and Hazardous Materials
- C. Heating and Air Conditioning Principles
- D. HVAC Parts and Operation
- E. A/C Compressors and Clutches
- F. Refrigerant and Oil Types and Handling
- G. A/C System Components and Operation
- H. Air Flow Management System
 - I. HVAC Electrical Circuits and Schematics
 - J. Advanced Electrical HAVC systems
- K. Engine Cooling System Parts and Operation
- L. Heater System Operation and Diagnosis
- M. Automatic Temperature Control Systems
- N. Hybrid Electric Vehicle HVAC Systems
- O. Refrigerant Recovery, Recycling and Handling
- P. Nationally Recognized HAVC Certification Test
- Q. IMACA
- R. ASE

V. METHODS OF INSTRUCTION:

- A. **Lecture** -

VI. TYPICAL ASSIGNMENTS:

- A. Lecture based assignments
- B. Text reading assignments
 - 1. Class discussion on reading assignment

VII. EVALUATION:

Methods/Frequency

- A. Exams/Tests
monthly
- B. Quizzes
weekly

VIII. TYPICAL TEXTS:

1. Johanson, Chris. *Auto Heating and Air Conditioning*. 5 ed., Goodheart-Wilcox, 2021.
2. Duffy, James. *Modern Automotive Technology*. 9 ed., Goodheart Wilcox, 2020.

IX. OTHER MATERIALS REQUIRED OF STUDENTS:

- A. Computer with internet access