

Course Outline for NAUT CA5

CONCEPTS OF BRAKES

Effective: Fall 2021

I. CATALOG DESCRIPTION:
 NAUT CA5 — Noncredit

This class is lecture only and non-credit. Diagnosis, evaluation, inspection, adjustment, and repair of braking, antilock braking systems, traction control and related devices. Class will involve California State law regarding brake and safety inspections. Includes the material on the California Brake Adjuster's Licensing Examination.

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. Describe the theory and fundamentals of automotive brake, anti-lock brake electronic traction control, and steering stability systems;
- B. Use basic testing and diagnostic tools and equipment in the inspection, diagnosis and repair of automotive braking systems;
- C. Demonstrate the ability to access the vehicle computer and various sensors relating to brakes and suspension systems;
- D. Demonstrate safe and appropriate handling of hazardous material;
- E. Accurately investigate and catalogue consumer concerns;
- F. Maintain a clean and professional environment.

IV. CONTENT:

- A. Automotive brakes
 1. Foundation brake systems
 - a. Hydraulic servo, dual-servo, advanced leading trailing and leading trailing
 - b. Caliper and piston front
 - c. Caliper and piston rear
 2. Anti-Lock systems and sub-systems
 - a. Wheel speed sensors
 - b. Vehicle speed sensors
 - c. Hydraulic control units
 - d. Electrical control units
 3. Traction control systems, and sub-systems.
 - a. Wheel speed sensors
 - b. Vehicle speed sensors
 - c. Hydraulic control units
 - d. Electrical control units
 4. Steering Stability systems and subsystems
 - a. Wheel speed sensors
 - b. Vehicle speed sensors
 - c. Hydraulic control units
 - d. Electrical control units
 - e. Yaw Sensors
 - f. Pitch Sensors
 - g. Decelerometers
 - h. Steering input sensors
- B. Testing and diagnostic tools and equipment
 1. Proper and safe tool use procedures
 2. Diagnostic safety precautions
 3. Analysis of test results
 4. Digital volt, ohm meter reading (DVOM)
 5. Digital storage oscilloscope hook-up and reading
- C. Computer access
 1. Access vehicle on board computer

2. Refer to diagnostic service information
3. Evaluate sensor data
- D. Hazardous material handling
- E. Consumer concerns
 1. Research customer concerns, evaluate steps needed to repair concern
 2. Catalogue concern
 3. Repair Procedures
- F. Electrical Concerns
 1. Base Brakes
 2. ABS
 3. Traction Control
 4. Collision avoidance
- G. Professional environment

V. METHODS OF INSTRUCTION:

- A. **Lecture** -

VI. TYPICAL ASSIGNMENTS:

- A. Lecture based assignments
 1. Lecture on ABS.

VII. EVALUATION:

Methods/Frequency

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

VIII. TYPICAL TEXTS:

1. Duffy, James. *Modern Automotive Technology*. 9 ed., Goodheart-Wilcox, 2020.
2. California State Department Consumer Affairs *Brake Inspection Manual*, -, 2003.
3. Johanson, Chris. *Auto Brakes*. 5 ed., Goodheart Wilcox, 2021.

IX. OTHER MATERIALS REQUIRED OF STUDENTS:

- A. Computer with internet access