

**Course Outline for NAUT LABA**

**AUTOMOTIVE LAB**

**Effective: Fall 2020**

**I. CATALOG DESCRIPTION:**  
 NAUT LABA — Noncredit

Automotive Lab is an open laboratory class for basic automotive students. This class is for students desiring to expand their hands-on experience using their own vehicle. Instructor will provide technical and supervisory support to guide students in completion of their self initiated projects. Service information via computer service manuals will be available for students to use for vehicle information and research.

**Prerequisite**

AUTO INTR - Automotive Service and Introduction  
 with a minimum grade of C  
 (May be taken concurrently)  
 or

NAUT INTR - Automotive Service and Introduction  
 with a minimum grade of C  
 (May be taken concurrently)

**Grading Methods:**

Letter or P/NP

**Discipline:**

- Automotive Technology

**Noncredit Category**

J - Workforce Preparation

	<b>MIN</b>
<b>Total Noncredit Hours:</b>	<b>108.00</b>

**II. PREREQUISITE AND/OR ADVISORY SKILLS:**

**Before entering the course a student should be able to:**

**A. AUTOINTR**

1. Utilize and apply hazardous waste handling;
2. Identify and describe uses of automotive related tools;
3. Describe the importance of preventative maintenance and inspection procedures as they relate to the automobile;
4. Discuss four stroke engine cycle and identify engine parts;
5. Apply Ohm's law, read basic schematics, test automotive electrical systems;
6. Identify emissions components, understand 5 gas theory;
7. Discuss heating and cooling systems, perform basic cooling systems tests;
8. Identify air conditioning systems, understand cycles of refrigerant;
9. Discuss braking systems, perform a brake inspection, identify parts;
10. Differentiate between suspension and steering system types, inspect and qualify components;
11. Identify different transmissions, understand theory of operation of both manual and automatic transmissions and fluid requirements;
12. Restraints system identification, know safety concerns of each system and inspection of restraint systems;

**B. NAUTINTR**

1. Utilize and apply hazardous waste handling;
2. Identify and describe uses of automotive related tools;
3. Describe the importance of preventative maintenance and inspection procedures as they relate to the automobile;
4. Apply Ohm's law, read basic schematics, test automotive electrical systems;
5. Identify emissions components, understand 5 gas theory;
6. Discuss heating and cooling systems, perform basic cooling systems tests;
7. Identify air conditioning systems, understand cycles of refrigerant;
8. Discuss braking systems, perform a brake inspection, identify parts;
9. Differentiate between suspension and steering system types, inspect and qualify components;
10. Identify different transmissions, understand theory of operation of both manual and automatic transmissions and fluid requirements;
11. Restraints system identification, know safety concerns of each system and inspection of restraint systems;

**III. MEASURABLE OBJECTIVES:**

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

- A. Apply and Maintain a Safe work environment
  - 1. Practice proper vehicle lifting techniques
  - 2. Practice correct tool usage
  - 3. Analyze and categorize hazardous waste disposal
- B. Demonstrate a good example of professionalism in the work place
  - 1. Use proper judgement when working with peers
  - 2. Evaluate and apply instructions while working under a shop foreman (Instructor/head student)
  - 3. Judge when to ask for help or guidance
- C. Revise hands-on experience to further their career in the automotive field
- D. Construct and adapt critical thinking skills to diagnose and repair vehicles
  - 1. Measure and create time and labor estimates using Alldata and Shopkey.

**IV. CONTENT:**

- A. Shop safety and Handling of hazardous waste materials
  - 1. Occupational Safety Health Administration (OSHA) Shop standards applied
  - 2. Industry safety standards applied
  - 3. Hazardous material handling; waste oil, as well as other chemicals related to the automobile
- B. Professional environment
  - 1. Safety glasses (Clear lenses) worn in all Laboratory areas
  - 2. No loose clothing (Coveralls strongly recommended)
  - 3. Long hair secured
  - 4. No open toe shoes (safety shoes recommended)
  - 5. Work areas maintained; clean free of debris and spills
  - 6. Working with and next to other students in a shop environment
- C. Hands-on experience
  - 1. Using hand tools and diagnostic equipment to repair vehicles for example
    - a. Proper repair of intake manifold leak
    - b. Replacement of air conditioning compressor
    - c. Brake pad/shoe service
    - d. Diagnosis of Service Engine Soon Light using scanner
    - e. Evaluation of computer data stream using scanner
- D. Critical Thinking
  - 1. Reading diagnostic equipment and interpreting data
  - 2. Reading shop manual information and applying technical reading to repairing vehicles
- E. Receiving guidance from other students
- F. Using Alldata to find and apply time and labor guides for estimates

**V. METHODS OF INSTRUCTION:**

- A. **Observation** -
- B. **Lab** - Safety Presentation and Laboratory assignment, Collaborative lab projects and exercises, Individual lab projects and exercises, Individual Learning Contract

**VI. TYPICAL ASSIGNMENTS:**

- A. Collaborative Learning
  - 1. Safety Test
    - a. Perform Safety Test
    - b. Overview of Safety test with correct answers and explanation of answers
    - c. Laboratory tour and assignment, showing exits, evacuation plan, fire extinguishers, MSDS location, and location of shop equipment
- B. Individual Learning Contract
  - 1. What does the student wish to accomplish?
  - 2. Are the units taken sufficient to complete the project(s)?

**VII. EVALUATION:**

**Methods/Frequency**

- A. Exams/Tests
  - Safety Test
- B. Group Projects
  - weekly
- C. Class Participation
  - daily
- D. Lab Activities
  - daily

**VIII. TYPICAL TEXTS:**

- 1. Halderman, James. *ASE Test Preparation and Study Guide*. 2 ed., Pearson, 2017.
- 2. Gilles, Tim. *Automotive Service: Inspection and Maintenance*. 6 ed., Cengage, 2020.
- 3. Johanson, Chris. *Auto Heating and Air Conditioning*. 4 ed., Goodheart-Wilcox, 2015.
- 4. Alldata. Alldata, (Current).

**IX. OTHER MATERIALS REQUIRED OF STUDENTS:**

- A. Safety Glasses