

Lassen Community College Course Outline

AT-54 Brakes

3.0 Units

I. Catalog Description

This course is designed to provide the student with skills in automotive brakes; disassembly and repair of drum, disc, hydraulic systems, including power and manual brakes. Several anti-lock brake systems (ABS) will be covered. Machining of drums, rotors, and adjustments will also be studied. This course adheres to ASE Education Foundation standards. This course has been approved for Hybrid Delivery.

Recommended Preparation: Successful completion of ENGL105 or equivalent multiple measures placement.

34 Hours Lecture, 51 Hours Lab, 68 hours out-of-class, 153 total student learning hours
Scheduled: Fall

II. Coding Information

Repeatability: Take 1 Time
Grading Option: Graded or Pass/No Pass
Credit Type: Credit - Degree Applicable
TOP Code: 094800

III. Course Objectives

A. Course Student Learning Outcomes

Upon completion of this course the student will be able to:

1. Diagnose, analyze, and repair common brake malfunctions, using normal shop tools and equipment at a beginner level.
2. Demonstrate proper use of tools and equipment used when repairing and adjusting a vehicle braking system at a beginner level.

IV. Course Content

A. Safety and brake basics

1. Shop safety and routines
2. Vehicle identifying information, customer concern, related service history, cause, and correction.
3. Identify and interpret brake system concern; determine necessary action.

B. Hydraulic brake system

1. Hydraulic theory
2. Fluid types
3. System components
4. Valves and switches
5. Brake line inspection and fabrication (double and ISO flares)

C. Hydraulic system component service

1. Master cylinder theory
2. Master cylinder removal and replacement procedures and bleeding
3. Wheel cylinder removal and replacement procedures
4. Brake pedal height, free play, travel, and adjustment

- D. Drum-brakes**
 - 1. Theory of operation
 - 2. Drum-brake components
 - 3. Disassembly and reassembly procedures
 - 4. Drum inspection and measurement
 - 5. Emergency/park brake theory and operation
- E. Disk-brakes**
 - 1. Theory of operation
 - 2. Disc-brake components
 - 3. Disassembly and reassembly procedures
 - 4. Rotor inspection and measurement
- F. Wheel Bearings**
 - 1. Theory of operation
 - 2. Bearing types
 - 3. Cleaning and inspection
 - 4. Packing and adjustment
- G. Machining drums and rotors**
 - 1. Measurement and inspection
 - 2. Brake lathe operation
 - 3. On-car brake lathe
- H. Anti-Lock Brake Systems (ABS) and traction control systems**
 - 1. ABS and traction control theory and components
 - 2. ABS and traction control diagnosis and service
 - 3. Bleeding procedures
 - 4. Regenerative braking

V. Assignments

A. Appropriate Readings

- 1. Industry materials as furnished by the instructor
- 2. Trade magazines
- 3. Manufacturers' bulletins
- 4. Current professional manuals

B. Writing Assignments

Typical writing assignments will include:

- 1. Providing written answers to assigned questions
- 2. Performing mathematical calculations as assigned
- 3. Maintaining a notebook of class assignments/activities

C. Expected Outside Assignments

Appropriate out-of-class assignments may include:

- 1. Researching appropriate readings
- 2. Preparing written assignments and completing homework as assigned.
- 3. Studying as needed for successful classroom performance

D. Specific Assignments that Demonstrate Critical Thinking

Students will perform analysis and evaluation of readings and/or classroom materials and utilize this analysis in classroom discussion, writing assignments, and in performing laboratory activities. Students must select and use appropriate methods and materials needed to complete laboratory assignments.

VI. Methods of Evaluation

Traditional classroom delivery:

Term paper (topic choice, thesis statement, outline, bibliography, rough draft, final draft), homework, classroom discussion, essay, journals, lab demonstrations and activities, multiple choice quizzes, and participation.

Hybrid Evaluation

All quizzes and exams will be administered during the in person class time. Students will be expected to complete online assignments and activities equivalent to in class assignments and activities for the online portion of the course. Electronic communication, both synchronous and asynchronous (chat/forum) will be evaluated for participation and to maintain effective communication between instructor and students.

VII. Methods of Delivery

Check those delivery methods for which, this course has been separately approved by the Curriculum/Academic Standards Committee.

Traditional Classroom Delivery Correspondence Delivery

Hybrid Delivery Online Delivery

Traditional Classroom Delivery:

The appropriate method of instruction will be determined by the instructor and may include:

1. Lecture with or without various audio/visual aids.
2. Group problem solving, discussion, debate, and/or critique.
3. Demonstration
4. Computer-assisted/other self-paced instruction.
5. Field trips or field assignments.
6. Laboratory assignments utilizing planned activities or 'live' work.

Hybrid Delivery:

Hybrid modality may involve face to face instruction mixed with online instruction. A minimum of 1/3 of instruction, including 100% labs, will be provided face to face. The remaining hours will be taught online through a technology platform as adopted by the district.

VIII. Representative Texts and Supplies

Goodnight & VanGelder; *Master Automotive Technician Series Automotive Braking Systems*, 2018, Jones & Bartlett Learning, ISBN 9781284102123

Industry materials as furnished by the instructor

Current professional manuals

Appropriate shop clothing, proper footwear, and safety glasses.

IX. Discipline/s Assignment

X. Course Status

Current Status: Active

Original Approval Date: 6/1/1990

Revised By: Chad Lewis

Curriculum/Academic Standards Committee Revision Date: 10/17/2023