

Lassen Community College Course Outline

AT-54 Brakes

3.0 Units

I. Catalog Description

This course covers design, operation, diagnosis, and service information to prepare students for on-the-job success. Brake system operation is fully explained before troubleshooting, service, and repair are discussed. This course also covers Anti-lock brakes and traction control operation, inspection, troubleshooting, and repair of these important systems. Scan tool use and trouble code retrieval for diagnosis is also covered. This text is a valuable resource for anyone who needs a thorough understanding of today's brake systems, including those preparing for ASE Certification Test A5, Brakes. This course adheres to ASE Education Foundation standards. This course has been approved for Hybrid Delivery.

Diversity Statement

This Course is committed to fostering a learning environment that embodies the principles of Diversity, Equity, Inclusion, and Accessibility (DEIA). This program believes that a diverse classroom enhances the educational experience for all students and prepares them for success in a global workforce.

Diversity: The course curriculum is designed to celebrate the unique backgrounds, identities, and experiences of all students. Diverse perspectives are integrated into instructional content and classroom discussions to enrich the educational experience and reflect the global workforce environment.

Equity: This course acknowledges the varying strengths and challenges that students bring to the learning process. Equitable opportunities are provided to all learners through access to resources, support systems, and targeted encouragement. The course design includes strategies to identify and remove barriers to student achievement.

Inclusion: The course fosters a welcoming and engaging environment where all students feel valued and respected. Collaborative learning opportunities and open dialogue are emphasized, allowing students to contribute their ideas and experiences. A culture of mutual respect and understanding is cultivated to ensure that all voices are heard.

Accessibility: Course materials and teaching practices are structured to ensure accessibility for all students, including those with disabilities. Accommodation is provided as needed, diverse teaching methods are employed, and resources are designed to be universally accessible and easy to understand.

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

Additional Course Information

Transfer Status:

- Non Transfer Status

Total Number of Hours by Instructional Method:

- 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.

B. Course Objectives

1. Service Disc and Drum brakes
2. Bleed Brake systems
3. Pack, adjust and Replace wheel bearings
4. Trouble Shoot common brake system faults

IV. Course Content

A. Outline of Topics

1. Introduction to Brake Systems
2. Shop Safety and Environmental Protection
3. Brake Tools, Shop Equipment, and Service Information
4. Hydraulic System Fundamentals
5. Master Cylinders, Calipers, and Wheel Cylinders
6. Master Cylinder, Caliper, and Wheel Cylinder Service
7. Power Assist Units
8. Power Assist Unit Service
9. Hydraulic Valves, Switches, Lines, and Hoses
10. Hydraulic Valve, Switch, Line, and Hose Service
11. Friction Brake Theory
12. Disc Brake System Components and Operation
13. Disc Brake Service
14. Drum Brake System Components and Operation

15. Drum Brake Service
16. Wheel Bearings and Oil Seals
17. Wheel Bearing and Oil Seal Service
18. Parking Brakes
19. Parking Brake Service
20. Brake System Electrical and Electronic Components
21. Anti-Lock Brake and Traction Control System Components and Operation
22. Anti-Lock Brake and Traction Control System Service
23. Troubleshooting Brake Systems
24. ASE Certification
25. Career Preparation

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

1. 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.
2. Students must select and use appropriate methods and materials needed to complete laboratory assignments.

VI. Methods of Evaluation

Traditional Evaluation

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

Quizzes and exams could be administered in person and/ or online. 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

Lecture, discussion, audio/visual aids, demonstration, group exercises, guest speakers, lab, individualized programs and other as needed.

Hybrid Delivery for Courses with a Lab

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

- A. Text: Industry materials as furnished by the instructor current professional manuals. Most current publication/edition will be used for all manuals. Students must have appropriate clothing, proper footwear, and safety glasses.

- B. Text Book Author Johanson, Chris and Stockel, Martin, *Auto Brakes*, 5th Edition, 2021, The GoodHeart-Willcox Company INC., 2021 ISBN Print 978-1-64564-076-9 Digital 979-8-89118-880-8 Low Cost option for degree path ISBN 979-8-89118-925-6.

IX. Course Status

1. Current Status: Active
2. Original Approval Date: 6/1/1990
3. Course Originator: Chad Lewis
4. Board Approval Date: TBA
5. Chancellor's Office Approval Date: TBA
6. Revised By: Chris Haley
7. Curriculum/Academic Standards Committee Revision Date: 11/19/2024