COURSE TITLE: Automotive brake systems
(AUMT 1410-6A1)

CREDIT
4-Semester Credit Hours

MODE OF INSTRUCTION
Face to Face

INSTRUCTOR CONTACT INFORMATION

Instructor: Bob Hodnett

Email: rhodnett@lit.edu

Office Phone: 409-257-0065

Office Location: ATC-#104

Office Hours: Tuesday/Thursday 7:30a.m.-10:25a.m. during semester.
By appointment only.

PREREQUISITE/CO-REQUISITE:
(NONE)

COURSE DESCRIPTION

The AUMT_1410 course describes the operation, construction, and related service for all types of automotive brake systems. You will learn about the construction, operation service, and repair of all types of braking systems. This includes detailed information on brake system hydraulics, disc brakes, drum brakes, and regenerative braking systems, as well as traction control systems and stability control systems. This will give the you the knowledge needed to work on any make or model car, truck, or sport utility vehicle. This course will help prepare you for the ASE certification test A5 brakes.

COURSE OBJECTIVES

At the end of this course each successful student should be able to:

Summarize the overall design and operation of a basic automotive brake system.
Define braking ratio.
Explain in detail how a hydraulic brake system works.
Describe the basic functions and operation of the major parts of disc brake and drum brake systems.
Compare the operation of mechanical and electrical parking brakes.
Explain the operation of electric regenerative braking systems.
Diagnose common brake system problems.
Inspect and maintain a brake system.
Inspect and replace a power brake booster.

Describe the basic procedures for servicing a master cylinder, including manual, pressure, and vacuum bleeding of a brake system.
Describe basic procedures for servicing brake lines and hoses.
Service a brake disc by performing disc measurements, resurfacing, and reassembly.
Inspect and service a drum brake assembly, including disassembly, brake shoe replacement, resurfacing, reassembly, and preadjusting.
Perform a parking brake adjustment
Identify the components of an anti-lock brake system and describe system operation
Describe the purpose of a traction control system.
Diagnose and service anti-lock braking systems
Diagnose and repair electronic stability and traction control systems
List the steps for completing a final anti-lock brake system check after service

REQUIRED TEXTBOOK AND MATERIALS

1. Modern Automotive Technology (Digital Textbook)
   Author: James E. Duffy/Brian Lacroix
   Publisher: Goodheart and Willcox Company, Inc.
   ISBN # 979-8-89118-991-1 11^{th} edition *
2. Modern Automotive Technology (Digital Workbook))
   Author: James E. Duffy/Brian Lacroix
   Publisher: Goodheart and Willcox Company, Inc.
   ISBN # 979-8-89118-991-1 11^{th} edition *
3. Modern Automotive Technology (Digital Shop Manual)
   Author: James E. Duffy/Brian Lacroix
   Publisher: Goodheart and Willcox Company, Inc.
   ISBN # 979-8-89118-991-1 11^{th} edition *
4. Notebook and 8.5" x 11" notebook paper
5. Blue and Black ink pen.
6. Lap top or Tablet with internet capability's
7. SAFETY GLASSES-clear (Glasses must meet ANSI standards, Z87 or Z87plus) as per OSHA 1910.133

ATTENDANCE POLICY

1. Missing more than 20% of classes will result in an automatic "F" for the course.
2. Absences are counted for unexcused, excused and coming to class late.
3. Missing more than 20% of a class period will count as an absence.
4. Being tardy 3 times equals 1 absence.

DROP POLICY

If you wish to drop a course, you are responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an "F" in the course.

Course Schedule

Week#	Topic	Reference
1/2/3	Course introduction, policies, Brake system basics • Lecture • Chapters 43 • Quiz	
4/5/6	Brake system basics cont. Brake system components R&R • Lab • Chapter 43 • Test	
7/8	Brake system Diagnosis and service • Lecture • Chapter 44 • Quiz	
9/10	Brake system diagnosis & service • Lab • Chapter 44 • Test	
11/12	Anti-lock brakes • Lecture/Lab • Chapter 45 • Review Chapter 45 • Quiz	
13/14/15	Traction control and stability control • Lecture/Lab • Chapter 45 • Test	
16	Finals Week Test	

Calendar dates are subject to change due to unforeseen circumstances.
Check Blackboard for any changes in due dates

COURSE EVALUATION

Final grades will be calculated according to the following criteria:

Daily work, quizzes, and homework assignment.	**40%**
Lab	**30%**
Homework	**15%**
Final Exam	**15%**
Total	***100%***

GRADE SCALE

- 90-100 A
- 80-89.9 B
- 70-79.9 C
- 60-69.9 D
- 0-59.9 F

TECHNICAL REQUIREMENTS

1. The latest technical requirements, including hardware, compatible browsers, operating systems, etc. can be online at https://lit.edu/online-learning/online-learning-minimum-computer-requirements. A functional broadband internet connection, such as DSL, cable, or WiFi is necessary to maximize the use of online technology and resources.

DISABILITIES STATEMENT

The Americans with Disabilities Act of 1990 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. LIT provides reasonable accommodations as defined in the Rehabilitation Act of 1973, Section 504 and the Americans with Disabilities Act of 1990, to students with a diagnosed disability. The Special Populations Office is located in the Eagles' Nest Room 129 and helps foster a supportive and inclusive educational environment by maintaining partnerships with faculty and staff, as well as promoting awareness among all members of the Lamar Institute of Technology community. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409)-951-5708 or email specialpopulations@lit.edu. You may also visit the online resource at Special Populations - Lamar Institute of Technology (lit.edu).

STUDENT CODE OF CONDUCT STATEMENT

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at www.lit.edu. Please note that the online version of the *LIT Catalog and Student Handbook* supersedes all other versions of the same document.

ARTIFICIAL INTELLIGENCE STATEMENT

Lamar Institute of Technology (LIT) recognizes the recent advances in Artificial Intelligence (AI), such as ChatGPT, have changed the landscape of many career disciplines and will impact many students in and out of the classroom. To prepare students for their selected careers, LIT desires to guide students in the ethical use of these technologies and incorporate AI into classroom instruction and assignments appropriately. Appropriate use of these technologies is at the discretion of the instructor. Students are reminded that all submitted work must be their own original work unless otherwise specified. Students should contact their instructor with any questions as to the acceptable use of AI/ChatGPT in their courses

STARFISH

LIT utilizes an early alert system called Starfish. Throughout the semester, you may receive emails from Starfish regarding your course grades, attendance, or academic performance. Faculty members record student attendance, raise flags and kudos to express concern or give praise, and you can make an appointment with faculty and staff all through the Starfish home page. You can also login to Blackboard or MyLIT and click on the Starfish link to view academic alerts and detailed information. It is the responsibility of the student to pay attention to these emails and information in Starfish and consider taking the recommended actions. Starfish is used to help you be a successful student at LIT.

ADDITIONAL COURSE POLICIES/INFORMATION

1. **No Cell Phone** or **Electronic Devices** allowed in class, unless it is known to the instructor, for a special reasoning. ***All cell phones must be turned off and put away. Text messaging during class time will not be tolerated. Text messaging during an exam will be considered academic dishonesty. The exam will be considered over and the student will receive a zero for the exam***.
2. **No** smoking or use of any **tobacco** products allowed
3. Do not bring any **food** or **drinks** in class
4. No visitor allowed in class including children
5. **Do not disturb lecture for any reason. If you must leave class or come in late, do so without disturbing class.**
6. **DRESS CODE: Proper work attire only, NO *Open shoes, Short pants, low riding, or sleeveless shirts*, will be allowed in any program classrooms.**
7. **No** grades will be **dropped**, No homework or assignments can be made up or accepted after instructor has taken up for grading.

8. **Student MUST sign in on daily individual course sign in sheet. NO sign in equals absent that day.**
9. Assignment must be turn in at the beginning of class
10. Any student caught cheating will be dropped from class and given an F for the semester grade.
11. Students are required to be present for all examinations and lectures.
12. There is NO MAKE-UP for missing any quizzes or major test or exams
13. Learning activities will be subjectively graded by the instructor. Students assigned to a group must be present at all times when the project is being worked on.
14. Instructor will reply to students email in a reasonable time or within 3 working days. Not available on Friday, Saturday, Sundays, Holidays or days the campus is closed.

NOTE:

Students who violate any of these policies will be asked to leave class and given an absent for the class period. Students who are continuing disturbing classes will be suspended from class for the remainder of the semester and given an grade of F.

Students may vary in their competency levels on these abilities. You can expect to acquire these abilities only if you honor all course policies, attend classes regularly, complete all assigned work in good faith and on time, and meet all other course expectations of you as a student.

Course Outline:

Brake Systems:

Brake system technology:

Basic brake system

Braking ratio

Brake system hydraulics

Brake system components

Parking brakes

Hybrid and electric vehicle brakes

Brake system diagnosis and service

Brake system diagnosis and service:

Brake system problem diagnosis

Brake system inspection

Power brake booster service

Master cylinder service

Brake line and hose service

Disc brake service

Brake rotor service

Drum brake service

Parking brake adjustments

Anti-lock brakes, Traction control, and stability control systems:

Anti-lock brake systems

Traction control systems

Electronic stability control systems

ABS service

Electronic stability and traction control service

Final ABS check