COURSE TITLE: Automotive manual drive trains & axles (AUMT 2313-6A1)

CREDIT

3 Semester Credit Hours (2 hours lecture, 4hour Lab)

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 10:30a.m.-12:00p.m. pm during semester. By appointment only.

PREREQUISITE/CO-REQUISITE:

(NONE)

COURSE DESCRIPTION

The AUMT_2313 course describes the operation, construction, and related service for all types of automotive drive trains. You will learn about front-wheel drive, rear-wheel drive, and all-wheel drive. This will give the you the knowledge needed to work on any make or model car, truck, or sport utility vehicle. Studying this section will help prepare you for two ASE certification tests: Test A2, Automatic Transmission/Transaxle, and Test A3, Manual Drive Train and Axles.

COURSE OBJECTIVES

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

Explain the action of a clutch.

Describe the parts of a clutch system and how they work together.

List the major parts of a manual transmission and explain the function of the assembly.

Describe gear function and the common gear types used in manual transmissions.

Identify each part of a manual transmission.

Recall the types of manual transmissions.

Trace power flow through the transmission gears.

Summarize the purpose of manual transmission sensors and switches.

REQUIRED TEXTBOOK AND MATERIALS

1. Modern Automotive Technology (Digital Textbook)
   Author: James E. Duffy/Brian Lacroix
   Publisher: Goodheart and Willcox Company, Inc.
   ISBN # 979-8-89118-989-8 11^{th} edition *
2. Modern Automotive Technology (Digital Workbook))
   Author: James E. Duffy/Brian Lacroix
   Publisher: Goodheart and Willcox Company, Inc.
   ISBN # 979-8-89118-989-8 11^{th} edition *
3. Modern Automotive Technology (Digital Shop Manual)
   Author: James E. Duffy/Brian Lacroix
   Publisher: Goodheart and Willcox Company, Inc.
   ISBN # 979-8-89118-989-8 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

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, manual transmission/transaxle & clutch technology • Lecture/Lab • Chapters 30 • Quiz	Handouts
4/5/6	Manual transmission/transaxle & clutch diagnosis & service • Lecture/ Lab • Chapter 31 • Quiz	
7/8	Driveline technology • Lecture/Lab • Chapter32 • Review Chapters 30,31,32 • Test	
9/10	Driveline diagnosis & service • Lecture/Lab • Chapter 33 • Review Chapter 33 • Quiz	
11/12	Differential, drive axle, & transfer case technology • Lecture/Lab • Chapter 34 • Review Chapter 34 • Quiz	
13/14/15	Differential, drive axle, & transfer case diagnosis & service • Lecture/Lab • Chapter 35 • Review Chapters: 35 • 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	**10%**
Final Exam	**20%**
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 found 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

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. **Homework** must be done **in proper outline form, neat and legible**, prepared on **loose leaf (8.5" X 11") note book paper**, written only on **one** side.
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:

Manual Transmission/Transaxle and Clutch Technology

Clutch Principles

Clutch Construction

Basic Manual Transmission

Gear Fundamentals

Manual Transmission/Transaxle Construction

Manual Transmission and Transaxle Types

Manual Transmission Power Flow

Manual Transmission Sensors and Switches

Manual Transmission/Transaxle and Clutch Diagnosis and Service Manual

Transmission/Transaxle Concern Diagnosis

Manual Transmission/Transaxle Problems

Manual Transmission/Transaxle Service

Clutch Concern Diagnosis

Clutch Service

Driveline Technology

Drive Shaft Assembly

Drive Shaft Operation

Universal Joints

Independent Drive Axles

Driveline Diagnosis and Service

Drive Shaft Assembly Concerns

Drive Shaft Inspection

Drive Shaft Maintenance and Service

Independent Drive Axle Concerns

Independent Drive Axle Service

Differential, Drive Axle, and Transfer Case Technology

Basic Drive Axle Assembly

Differential Construction

Differential Operation

Limited-Slip Differentials

Drive Axles

Front Differential Assemblies

Transfer Cases

Differential, Drive Axle, and Transfer Case Diagnosis and Service

Differential Problem Diagnosis

Differential Maintenance

Drive Axle Service

Differential Service

Transfer Case and Power Transfer Unit Service