

**COURSE TITLE:** Automotive Electrical systems

(AUMT 1407\_6A1)

**CREDIT**

4 Semester Credit Hours (3 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: Monday / Wednesday 10:30a.m.-12:00p.m. pm during semester.  
By appointment only.

**PREREQUISITE/CO-REQUISITE:**

(NONE)

**COURSE DESCRIPTION**

This course will introduce you to the basics of automotive electricity and electronics. This course will provide you with the sound background in electricity and electronics necessary to effectively troubleshoot and service today's complex vehicle systems. This course then presents detailed information on 12-volt battery operation and maintenance before progressing to a more detailed operation, diagnosis, and service of the 12-volt systems.

**COURSE OBJECTIVES:**

Upon completion of this course, the student will be introduced to the basics of automotive electricity and electronics. This course will provide you with the sound background in electricity and electronics necessary to effectively troubleshoot and service today's complex vehicle systems. The course then presents detailed information on 12-volt battery technology, diagnosis, principles, maintenance, function, and service, before progressing to more in-depth details of the operation, diagnosis, and service of the 12-volt starting and charging systems, supplemental restraint system, lights and instrumentation, and power accessories.



**LAMAR INSTITUTE  
OF TECHNOLOGY**

**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<sup>th</sup> 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<sup>th</sup> 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<sup>th</sup> 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. Basic-Digital volt ohm meter (DVOM) AC/DC/Ohm measurements.

**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, & basic electrical principles <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Chapter: 46</li><li>• Quiz</li></ul>
4/5	Circuit types & ohm's law <ul style="list-style-type: none"><li>• Lecture/ Lab</li><li>• Chapter: 47</li><li>• Quiz</li></ul>
6	Electrical & electronic components. <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Chapter: 48</li><li>• Test</li></ul>
7/8	Electrical tools & test equipment <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Chapter: 49</li><li>• Quiz</li></ul>
9/10	Wiring diagrams & wiring repairs <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Chapter: 50</li><li>• Quiz</li></ul>
11/12/13	Basic electrical tests <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Chapter: 51</li><li>• Test</li></ul>
14/15	12-volt battery technology, diagnosis & service. <ul style="list-style-type: none"><li>• Lecture/Lab</li><li>• Chapters: 52</li><li>• Test</li></ul>
16	Finals Week <ul style="list-style-type: none"><li>• Test</li></ul>

*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.	<b>40%</b>
Lab	<b>30%</b>
Homework	<b>10%</b>
<u>Final Exam</u>	<b>20%</b>
<b><i>Total</i></b>	<b>100%</b>

#### **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](mailto: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](http://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.

1. **ADDITIONAL COURSE POLICIES/INFORMATION** **No Cell Phone** use will be allowed in class, unless it is known to the instructor, for a special reasoning.
2. **No Cell Phone** use will be 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.*
3. **No** smoking or use of any **tobacco** products allowed including VAPES.
4. Do not bring any **food** or **drinks** in class
5. No visitor allowed in class including children
6. **Do not disturb lecture for any reason. If you must leave class or come in late, do so without disturbing class.**
7. **DRESS CODE: Proper work attire only, NO Open shoes, Short pants, low riding, or sleeveless shirts, will be allowed in any program classrooms.**
8. **No** grades will be **dropped**, No homework or assignments can be made up or accepted after instructor has taken up for grading.
9. **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.
10. Assignment must be turn in at the beginning of class

11. Any student caught cheating will be dropped from class and given an F for the semester grade.
12. Students are required to be present for all examinations and lectures.
13. There is NO MAKE-UP for missing any quizzes or major test or exams
14. 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.
15. 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 continually 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:**

**Electricity and Electronics Systems:**

**Electrical Principles**

Atomic Structure

Electricity Magnetism

Electric Circuits

Direct and Alternating Current

**Circuit Types and Ohm's Law**

Circuit Types

Ohm's Law

Prefixes for Electrical Units

**Electrical and Electronic Components**

Electrical Components

Electronic Components

## **Electrical Tools and Test Equipment**

Electrical Repair Tools

Electrical Test Equipment

## **Wiring Diagrams and Wiring Repairs**

Automotive Wiring

Cutting and Stripping Wire

Soldering

Connectors

Testing Fuse Links and Adding Electrical Accessories

Wiring Diagrams

## **Basic Electrical Tests**

Identifying Circuit Problems Electrical Diagnosis and Repair

Types of Circuit Problems

Using Jumper Wires and Test Lights

Using a Multimeter

Basic Component Tests

## **12-Volt Battery Technology, Diagnosis, and Service**

Battery Principles

Battery Functions

12-Volt Batteries

12-Volt Battery Maintenance

12-Volt Battery Service