

## Automotive Engine Theory (AUMT 2305)



**Credit:** 3 semester credit hours (3 hours lecture, 0 hours lab)

**Prerequisite/Co-requisite:** None

### Course Description

Fundamentals of engine operation and diagnosis including lubrication and cooling systems. Emphasis on identification of components, measurements, inspections, and repair methods for most Gasoline Engines.

### Required Textbook and Materials

1. **Modern Automotive Technology**  
Author: James E. Duffy  
Publisher: Goodheart – Willcox Company  
ISBN13: 978-1-61960-370-7, 8<sup>th</sup> edition
2. **Modern Automotive Technology- Work Book**  
Author: James E. Duffy  
Publisher Goodheart – Willcox Company  
ISBN13: 978-1-61960-375-2, 8<sup>th</sup> edition
3. Notebook and 8.5” x 11” notebook paper
4. Blue and Black ink pens

### Course Objectives

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

1. Explain appropriate safety procedures.
2. Demonstrate familiarity with historical development and information on the automotive industry.
3. Demonstrate safe, professional, and responsible work practices.
4. Identify and demonstrate the proper use of shop equipment and tools.
5. Identify and describe functions of vehicle subsystems.
6. Demonstrate the use of service publications.
7. Identify various automotive fasteners used in industry.
8. Perform automotive maintenance “A” check.

### Course Outline

- |                           |                        |
|---------------------------|------------------------|
| A. Safety and Shop Policy | B. Engine Fundamentals |
| 1. Auto shop Layout       | 1. Engine Operation    |
| 2. Shop Safety            | 2. Engine Bottom End   |
| 3. General Safety Rules   | 3. Engine Top End      |
| 4. Customer Relations     | 4. Engine Front End    |

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C. Engine Design Classification

1. Cylinder arrangement
2. Alternative fuels
3. Typical automotive engines

D. Engine Top, Bottom, and Front End Construction

1. Top end construction
2. Bottom end construction
3. Front end construction

E. Engine Size and Performance Measurement

1. Determine engine size
2. Engine terms
3. Torque and horse power

F. Cooling System Fundamentals

1. Cooling System Functions
2. Cooling System Operation
3. Cooling System Types
4. Basic cooling system
5. Closed & Open Cooling Systems
6. Cooling System Instrumentation
7. Antifreeze and Conditioners
8. Engine Heaters

G. Coolant Testing and Maintenance

1. Cooling diagnosis
2. Cooling problems
3. Coolant service
4. Components service

H. Lubrication System Fundamentals

1. Lubrication System Functions
2. Lubrication System Operation
3. Positive Crankcase Ventilation System
4. Oil Pressure Indicator
5. Industry Trend

I. Lubrication system testing and service

1. Lubrication System Function
2. Lubrication System Problems
3. Lubrication service
4. Components service

J. On-Board Diagnostics and Scan Tools

1. On-Board Diagnostic Systems
2. Scanning Computer Problems
3. Energizing OBD I Systems without a Scan Tool
4. Erasing Trouble Code

**Grade Scale**

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

**Course Evaluation**

Final grades will be calculated according to the following criteria:

Daily work, quizzes, and homework assignment.	<b>40%</b>
Test over Lecture and Chapters	<b>30%</b>
Outside assignment or class presentation.	<b>10%</b>
<u>Final Exam</u>	<b><u>20%</u></b>
<b><i>Total</i></b>	<b><i>100%</i></b>

**Course Requirements**

1. Complete specific reading assignments in a timely manner specified by the instructor.
2. Seek out available material on the subject being taught, utilizing the library, periodicals and / or the Internet.

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3. Wear sleeved shirts, full length jeans or work pants and preferably leather shoes to class and on campus. No shorts or tank tops are allowed.
4. Participate in project interview when offered.
5. Complete all work book and class assignments.
6. Be present at class sessions and examinations as scheduled.

### **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.

If you wish to drop, you are responsible for the drop process. I will not initiate the drop, no matter how many absences or zeroes you have; that is, if you stop coming to class and do not drop, you will earn an F in the course. ***Students are allowed only 6 drops, from any public Institute of higher education, in their lifetime.***

### **Course Policies**

1. **No Cell Phone or Electronic Devices** allowed in class, except in special circumstances and it is approved by the instructor.  
*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.

### **NOTE:**

**Students who violate any of these policies will be asked to leave class and will be recorded as absent for the class period. Students who continue to disturb classes will be suspended from class for the remainder of the semester and receive a 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.*

### **Disabilities Statement**

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the online resource:

<http://www.lit.edu/depts/stuserv/special/defaults.aspx>

### **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) or obtained in print upon request at the Student Services Office.

### **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.



### Course Schedule

Week	Topic	Reference
1	Course introduction and policies <ul style="list-style-type: none"> <li>• Lecture</li> <li>• Class discussion</li> </ul>	Syllabus / Handouts
2/3	<ul style="list-style-type: none"> <li>• Auto Shop Safety</li> <li>• Lecture</li> <li>• Chapter assignments</li> <li>• Test chapter 5</li> </ul>	Chapter 5 Power point
4/5	Engine Fundamentals and Design Classification <ul style="list-style-type: none"> <li>• Lecture</li> <li>• Chapter Assignment</li> <li>• Test chapter 11</li> </ul>	Chapter 11
6/7	Engine Top, Bottom, and Front End Construction <ul style="list-style-type: none"> <li>• Lecture</li> <li>• Chapter Assignment</li> <li>• Test Chapter 13, 14, and 15</li> </ul>	Chapter 13, 14 & 15 Power point
8/9	Engine Size and Performance Measurements <ul style="list-style-type: none"> <li>• Lecture</li> <li>• Chapter Assignment</li> <li>• Test Chapter 16</li> </ul>	Chapter 16
10/11	Cooling System Fundamentals, Testing, and Maintenance <ul style="list-style-type: none"> <li>• Lecture</li> <li>• Chapter Exercises</li> <li>• Test chapter 47 &amp; 48</li> </ul>	Chapter 47 & 48
12/13	Lubrication system Fundamentals <ul style="list-style-type: none"> <li>• Lecture</li> <li>• Chapter assignment</li> <li>• Test chapter 49 &amp; 50</li> </ul>	Chapters 49 & 50
14/15	On Board Diagnostics and Scan Tools <ul style="list-style-type: none"> <li>• Lecture</li> <li>• Chapter assignment</li> <li>• Test chapter 24</li> </ul>	Chapter 24
16	Final Project and final exam <ul style="list-style-type: none"> <li>• Lecture</li> </ul>	Lecture/Review

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The course schedule is a proposed schedule. Changes in the schedule may be made based upon the instructor's professional judgment. If you are absent on a day in which changes to the schedule have been announced, it is your responsibility to find out those changes.

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