

COURSE TITLE (Advanced Diesel Tune-up and Troubleshooting (DEMR 2334-6A1)

CREDIT

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

MODE OF INSTRUCTION

Face to Face

PREREQUISITE/CO-REQUISITE:

(DEMR 1401)



**LAMAR INSTITUTE
OF TECHNOLOGY**

COURSE DESCRIPTION

Advanced concepts and skills required for tune-up and troubleshooting procedures of diesel engines. Emphasis on the science of diagnostics with a common sense approach. This is a capstone course for the Associate of Applied Science degree in Advanced Engine Technology

COURSE OBJECTIVES

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

1. Analyze engine malfunctions.
2. Determine corrective repair.
3. Perform engine repairs.
4. Adjust engine tune-up according to engine manual.
5. Identify basic engine troubleshooting procedures.
6. Build employability skills such as attitude, critical thinking, adaptability, and work ethics.

INSTRUCTOR CONTACT INFORMATION

Instructor: Pete Matak III

Email: pmatak@lit.edu

Office Phone: 409 247 5058

Office Location: ITC-2 104

Office Hours: Monday / Wednesday 1:30 – 2:30 pm during semester

REQUIRED TEXTBOOK AND MATERIALS

1. Diesel Technology Fundamentals, Service, Repair
Author: Norman, Corinchock, Scharff
Publisher: Goodheart and Willcox Company, Inc.
ISBN # 978-1-64564-685-3 9th edition *

2. Diesel Technology Workbook Fundamentals, Service, Repair
 Author: Norman, Corinchock, Scharff
 Publisher: Goodheart and Willcox Company, Inc
 ISBN # 978-1-64564-686-0 9th edition *
4. Notebook and 8.5" x 11" notebook paper
5. Blue and Black ink pens

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 CALENDAR

Week	TOPIC	READINGS	ASSIGNMENTS
1	Course Introduction and Class Policies	Lecture / Handouts Student Blackboard Cummins Quick Serve online	Review Handouts Class Quizzes
2	Personal and lab Safety orientation	Lecture on applications Lecture and class Lab: Practice and testing	Handout and Equipment Class Quizzes
3	Engine Reassembly and Installation	Lecture on assignment and testing Chapter 26 test	Complete assigned Review, ASE and Workbook Questions. Class Quizzes Chapter 26 Test
4	Lab project and group assignment	Lecture on assignment and testing Lab: hand on performance Project: As Assigned	DVD's and Computer programs
5-6	Lab project and group assignment	Lecture on assignment and testing Lab: hand on performance Project: As Assigned	Cummins Insite program. DVD's and lap top computers

7-8	Preventive Maintenance and Trouble shooting	Lecture on assignment and testing Chapter 27 test	Complete assigned Review, ASE and Workbook Questions. Class Quizzes Chapter 27 Test
9-10	Lab project and group assignment	Lecture on assignment and testing Lab: hand on performance Project: As Assigned	Cummins ISB and B series 5.9 and 6.7 maintenance and repairs. DVD"s and service manual
11-12	Lab project and group assignment	Lecture on assignment and testing Lab: hand on performance Project: As Assigned	60 series Detroit diesel Tune up and maintenance. Service manuals and films
13	Lab project and group assignment	Lecture on assignment and testing Lab: hand on performance Project: As Assigned	Deutz Diesel engine, Pump Timing and valve settings. Service manual
14	Lab project and group assignment	Lecture on assignment and testing Lab: hand on performance Project: As Assigned	92 Series V-6 engine tune and diagnostics. Service manuals
15	Lab project and group assignment	Lecture on assignment, testing and PC diagnostic Lab: hand on performance Project: As Assigned	ISX diagnostic of trouble codes
16	Final Project and Shop organization	Lecture and Review Final to be announced End of semester	Review for Final Exam Complete exam

COURSE EVALUATION

Final grades will be calculated according to the following criteria:

Daily work, quizzes, and homework assignment.	35%
Performance Work Grade	35%
Outside assignment or class presentation.	10%
<u>Final Exam</u>	<u>20%</u>
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

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.

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. **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. 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.
13. Instructor will reply to students email in a reasonable time or within 3 working days.

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

- A. Introduction
 1. Introduction of faculty and students
 2. Review Syllabus
 3. Review Class Policies
 4. Review Student Enrollment

- B. Personal and shop safety precautions
 - 1. General safety rules apply to student conduct
 - 2. Safety Precaution for each tasks
 - 3. Use of personal protection equipment
 - 4. Safety guideline that apply to the starting, testing, and stopping of the diesel engine
- B. Service Manual uses and application to diagnostics
 - 1. Cummins Engines
 - 2. Detroit Diesels
- C. Function of the electronic controls on the diesel engine
 - 1. Cummins Engines
 - 2. Detroit Diesels
- D. Troubleshooting diesel electronic controls
 - 1. Detroit Diesels
 - 2. Cummins Diesels
- E. Removal and retiming of fuel injection pumps
 - 1. Cummins Engines
 - 2. Detroit Diesels
 - 3. Deutz engines
- F. Circuit devices and symbols used on diesel engines
 - 1. Cummins Engines
 - 2. Detroit Diesels
- G. Circuit testing equipment and application
 - 1. Break out box and analyzers
 - 2. Ohm meter and circuit tester
- H. Basic troubling procedures to engine mechanical system
 - 1. Manual procedures
 - 2. Electronic procedures
- I. Tune-up of varieties of different design engines
 - 1. Cummins Engines
 - 2. Detroit Diesels
 - 3. Caterpillar engines
- J. Calculating worksheet for Repairs
 - 1. Cummins Engines
 - 2. Detroit Diesels
 - 3. All- Data program
- K. Air Intake Systems
 - 1. Air Intakes
 - 2. Scavenging and Supercharging
 - 3. Intake Air Cleaners
 - 4. Changing Air Filter Elements
 - 5. Intake Air Silencers
 - 6. Blowers
 - 7. Intake Air Passages
- L. Exhaust Systems
 - 1. Exhaust System Purpose
 - 2. Exhaust System Components
 - 3. Exhaust System Services
 - 4. Turbochargers

5. After coolers (Intercoolers)

6. Diesel Exhaust emissions

M. Career Opportunities

1. The Diesel Field

2. ASE Certification

3. Diesel

4. Occupational outlook

5. Places of employment