Diesel Engines II (DEMR 1449)

Credit: 4 semester credit hours (3 hours lecture, 4 hours lab)

Prerequisite: None

Course Description

An in-depth coverage of disassembly, repair, identification, evaluation, and reassembly of diesel engines.

Required Textbook and Materials

1. **Diesel Technology** Fundamentals / Service / Repair
   Author: Norman, Corinchock, Scharff
   Publisher: Goodheart and Willcox Company, Inc.
   ISBN # 1-59070-770-2
2. **Diesel Technology Workbook** Fundamentals / Service / Repair
   Author: Norman, Corinchock, Scharff
   Publisher: Goodheart and Willcox Company, Inc
   ISBN # 1-59070-771-0
3. **Glossary of Technical Terms** Fundamentals of Service
   Author: Deere and Company
   ISBN # 0-86691-321-1 ; 2nd edition
4. **In-line 71 Series Service Manual**
   Detroit Diesel Corporation
   Dealer: Stewart and Stevenson Service, Inc.
   Revision May 1994
5. Notebook and 8.5" x 11" notebook paper
6. Blue and Black ink pens
7. Safety glasses and suitable work clothes

Course Objectives

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

1. Identify engine components and their working relationship to the engine. F1.4, F2.4, F3.4, F5.2, F6.2, F7.2, F8.3, F9.3, F12.2, F13.2, C5.3, C7.2, C10.4, C15.3
   Evaluate engine components by inspection, testing, and/or measurement. F1.4, F2.4, F3.4, F5.2, F6.2, F7.2, F8.3, F9.3, F12.2, F13.2, F14.3, F15.4, F16.2, F17.3, C1.3, C3.2, C9.5, C5.3, C6.3, C7.2, C10.4, C14.2, C15.3, C16.2, C20.4
2. Explain orderly procedure of disassembly and reassembly of the diesel engine. F1.4, F2.4, F3.4, F5.2, F6.2, F7.2, F8.3, F9.3, F12.2, F13.2, F14.3, F15.4, F16.2, F17.3, C1.3, C3.2, C9.5, C5.3, C6.3, C7.2, C10.4, C14.2, C15.3, C16.2, C20.4
3. Explain personal and shop safety rules that must be practiced when working in the shop area while using tools and equipment. F2.4, F3.4, F5.2, C1.3, C3.2

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4. Identify engine nomenclature, description, and prepare proper work order. F2.4, F3.4, F5.2, C1.3, C3.2, C16.2

SCANS Skills and Competencies

Beginning in the late 1980's, the U.S. Department of Labor **S**ecretary's **C**ommission on **A**chieving **N**ecessary **S**kills (SCANS) conducted extensive research and interviews with business owners, union leaders, supervisors, and laborers in a wide variety of work settings to determine what knowledge workers needed in order to perform well on a job. In 1991 the Commission announced its findings in *What Work Requires in Schools.* In its research, the Commission determined that "workplace know-how" consists of two elements: foundation skills and workplace competencies. The three-part foundation skills and five-part workplace competences are further defined in the SCANS attachment.

Course Outline

A. Shop inspection
   1. Shop class policy
   2. Grading system
   3. Tools and shop equipment
   4. Shop safety
B. Engine operation
   1. Starting procedures
   2. Operation
   3. Emergency shut-downs
C. Engine identification
   1. Detroit diesel
   2. Cummins engines
D. Job sheets and engine reports
   1. Properly recording data of normal and abnormal wear
   2. Record improper assembly
   3. Justify repairs or replacement
   4. Determine the cause of failure
   5. Document all findings in report
E. Disassembly of the diesel engine
   1. Preparation for disassembly
   2. Organize parts
   3. Safety precaution
   4. Cylinder block
   5. Crankshaft and main bearing removal and installation
   6. Piston, rings, connecting rods, and bearing removal and installation
   7. Cylinder liners inspection, and installation
   8. Camshaft, bearings, and gears inspection
   9. Gear train timing and installation
   10. Flywheel and housing
F. Lubrication systems description, function, cleaning, inspection, and assembly
   1.Low pressure
   2. Oil type
G. Lubrication oil filters, coolers, and oil pan installation
   1. Testing
   2. Servicing

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, lab and homework assignment.	**35%**
Performance Work Grade	**35%**
Outside assignment or class presentation.	**10%**
Final Exam	**20%**
Total	**100%**

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.
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 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 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 office in Student Services, Cecil Beeson Building.

Course Schedule

Week	Topic	Reference
1	Course introduction and policies • Lecture • Lab: Practice	Handouts
2	Personal and lab Safety orientation • Lecture and class • Lab: Practice and testing	Handouts and equipment
3/4	Engine Operations • Lecture/ Lab: Exercises and Test • Demonstration on engine	Handouts Chapter 28 71 Service Manual
5/6	Identification of various engine and designed	71 service manual

Week	Topic	Reference
	• Lecture on handouts • Test on material • Visual identification in lab • Home work assignment	Handouts Filmstrips on engine
7	Job sheets and engine reports • Lecture • Handout Exercise • Test on Material	Handouts / Chapter 29
8	Preparation for engine Disassembly • Lecture in Lab • Exercises and Test • Homework assignment	Handout 71 Service Manual Chapter 28 Film strips
9/10	Safety precautions, organizing parts and procedures for repair. • Lecture • Test over lecture • Lab demonstration	71 Service Manual Handouts Chapter 28
11/12/13	Engine Disassembly • Lecture • Exercises and Test • Homework assignment	71 Service Manual Handouts Film strips
14	Lubrication Systems principal • Lecture / Filmstrips • Test on material • Homework assignment	71 Service Manual Handouts / Visual Aids Film strips
15	Semester shop follow up • Lecture / open discussion • Test over semester lectures • Project organization for end of semester	71 Service Manual Handouts
16	Final Project and Shop organization • Lecture and Review • Final to be announced • End of semester	Review and Handouts

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.

Contact Information:

Varies By Instructors