

DESL 1053 : Diesel Engines and Repairs

3 credit hours (2 lecture/2 lab)

This course provides the student with both theory and practical background in the basic operating and repair principles of diesel engines. The course includes practical experience in repairing, rebuilding, testing, troubleshooting, and tuning diesel engines. Additionally, the student will gain experience in the proper use of tools and equipment. The course is a mixture of textbook, videos, lecture, hands-on exercises and on-site instruction at a local diesel repair facility.

Topical Outline

- Various operating systems of the diesel engine
- Shop safety
- Tools, precision tools and fasteners
- Principles of operation
- Engine designs
- Fuel Injection systems including (injectors and pumps)
- Engine assemblies
- Lubrication systems
- Cooling systems
- Engine repair procedures
- Cold starting systems and components
- Basic engine operation
- Engine mechanical diagnosis and testing
- Cylinder head repair procedures
- Engine block repair procedures
- Failure analysis of bearings

Course Outcomes

At the end of this course, students will be able to:

1. Demonstrate proper shop safety practices while overhauling and repairing engines.
2. Identify tools and equipment used in engine repair.
3. Inspect and determine serviceability of cylinder head according to manufacturer specifications.
4. Inspect and determine serviceability of cylinder block according to recommended manufacturer specifications.
5. Adjust or measure valve and engine brake clearance.
6. Install camshaft according to manufacturer specifications.
7. Inspect connecting rods and pistons.
8. Measure the crankshaft and determine serviceability.
9. Diagnose and or repair of the oil lubrication system.
10. Install piston rings according to manufacturer specifications.
11. Install connecting rod and main bearings according to manufacturer specifications.
12. Assemble engine according to industry standards.
13. Perform timing of camshaft and components to manufacturer specifications.
14. Inspect cooling system and components for needed repair.
15. Perform injector replacement procedures.
16. Remove and reinstall the cylinder liner and check and adjust protrusion.
17. Change oil and filters and lubricate the complete chassis.
18. Identify and access engine computer control sensors and systems.