

DET 182A Course Outline as of Fall 2014**CATALOG INFORMATION**

Dept and Nbr: DET 182A Title: DIESEL ENGINE OVERHAUL

Full Title: Diesel Engine Overhaul

Last Reviewed: 1/22/2018

| Units | | Course Hours per Week | | Nbr of Weeks | Course Hours Total | |
|---------|------|-----------------------|------|--------------|--------------------|-------|
| Maximum | 3.00 | Lecture Scheduled | 2.50 | 17.5 | Lecture Scheduled | 43.75 |
| Minimum | 3.00 | Lab Scheduled | 2.00 | 8 | Lab Scheduled | 35.00 |
| | | Contact DHR | 0 | | Contact DHR | 0 |
| | | Contact Total | 4.50 | | Contact Total | 78.75 |
| | | Non-contact DHR | 0 | | Non-contact DHR | 0 |

Total Out of Class Hours: 87.50

Total Student Learning Hours: 166.25

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly: DET 82A

Catalog Description:

The operating principles and overhaul of the heavy duty diesel engine and related systems. Course involves disassembly and reassembly of engines, using service manuals to inspect components and analyze component failures.

Prerequisites/Corequisites:**Recommended Preparation:**

Eligibility for ENGL 100 or ESL 100 AND Course Completion or Concurrent Enrollment in DET 179

Limits on Enrollment:**Schedule of Classes Information:**

Description: The operating principles and overhaul of the heavy duty diesel engine and related systems. Course involves disassembly and reassembly of engines, using service manuals to inspect components and analyze component failures. (Grade Only)

Prerequisites/Corequisites:

Recommended: Eligibility for ENGL 100 or ESL 100 AND Course Completion or Concurrent

Enrollment in DET 179

Limits on Enrollment:

Transfer Credit:

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

| | | | |
|-------------------|----------------------|------------|-----------|
| AS Degree: | Area | Effective: | Inactive: |
| CSU GE: | Transfer Area | Effective: | Inactive: |

| | | | |
|---------------|----------------------|------------|-----------|
| IGETC: | Transfer Area | Effective: | Inactive: |
|---------------|----------------------|------------|-----------|

| | | |
|----------------------|------------|-----------|
| CSU Transfer: | Effective: | Inactive: |
|----------------------|------------|-----------|

| | | |
|---------------------|------------|-----------|
| UC Transfer: | Effective: | Inactive: |
|---------------------|------------|-----------|

CID:

Certificate/Major Applicable:

Both Certificate and Major Applicable

COURSE CONTENT

Outcomes and Objectives:

Upon successful completion of the course, students will be able to:

1. Differentiate among types of internal combustion engines.
2. Describe the fundamentals of internal combustion engine operation.
3. Interpret instructions in a service manual to successfully disassemble and reassemble an engine.
4. Measure, inspect, and evaluate serviceable diesel engine components using precision measurement tools and compare data to manufacturers' specifications.
5. Diagnose internal engine component failure.

Topics and Scope:

1. Engine fundamentals
 - a. Engine design
 - b. Theory and principles of operation
 - c. Internal engine diagnosis
 - d. Engine removal procedures
 - e. Engine disassembly
 - f. Engine cleaning and inspection
 - g. Service manuals and information
2. Blocks and liners
 - a. Engine block inspection and service
 - b. Liner inspection and service
3. Crankshafts
 - a. Crankshaft inspection and service
 - b. Crankshaft measurement
 - c. Crankshaft bearings and clearance
4. Pistons, rings, connecting rod service

- a. Piston inspection and service
- b. Piston ring identification and service
- c. Connecting rod inspection
- 5. Cylinder head service
 - a. Valve and seat inspection
 - b. Head inspection and service
- 6. Camshafts
 - a. Camshaft inspection and measurement
 - b. Camshaft drive systems
 - c. Camshaft timing set-up
- 7. Engine set-up
 - a. Valve adjustment
 - b. Injector timing
- 8. Engine lube systems
 - a. Engine oils, filters
 - b. Lube pump and system
- 9. Engine cooling system
 - a. Coolant and additives
 - b. Cooling system components
 - c. Cooling systems diagnosis and repair
- 10. Engine assembly procedures

Assignment:

- 1. Reading, 40-60 pages per week
- 2. Disassemble engine and measure critical engine components and compare to manufacture's specifications
- 3. Analyze engine components for wear
- 4. Prepare written lab report.(8-10 pages)
- 5. Perform engine reassembly according to manufacturer's instructions
- 6. 3 to 5 exams.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

| |
|------------|
| Lab report |
|------------|

| |
|--------------------|
| Writing 0 - 20% |
|--------------------|

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

| |
|---|
| Engine diagnosis and component analysis |
|---|

| |
|-----------------------------|
| Problem solving 10 - 30% |
|-----------------------------|

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Engine disassembly and assembly

Skill Demonstrations
10 - 30%

Exams: All forms of formal testing, other than skill performance exams.

3 to 5 Exams

Exams
20 - 50%

Other: Includes any assessment tools that do not logically fit into the above categories.

None

Other Category
0 - 0%

Representative Textbooks and Materials:

Diesel Technology: Fundamentals, Service, Repair. Norman, Corinchock, Goodheart-Wilcox Pub. 7th Ed., 2007. (classic)