

CATALOG INFORMATION

Dept and Nbr: DET 82A

Title: INTERNAL COMB ENG OVRHAU

Full Title: Internal Combustion Engine Overhaul

Last Reviewed: 1/22/2018

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	3.00	Lecture Scheduled	1.50	17.5	Lecture Scheduled	26.25
Minimum	3.00	Lab Scheduled	4.50	8	Lab Scheduled	78.75
		Contact DHR	0		Contact DHR	0
		Contact Total	6.00		Contact Total	105.00
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 52.50

Total Student Learning Hours: 157.50

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:

Catalog Description:
The operating principles of the internal combustion engine and related systems. Course involves disassembly and reassembly of a variety of engines on stands, using service manuals to inspect components and analyze component failures.

Prerequisites/Corequisites:

Recommended Preparation:
Eligibility for ENGL 100 or ESL 100.

Limits on Enrollment:

Schedule of Classes Information:
Description: Operating principles of the internal combustion engine and related systems. Course involves disassembly and reassembly of a variety of engines on stands, using service manuals to inspect components and analyze component failures. (Grade Only)
Prerequisites/Corequisites:
Recommended: Eligibility for ENGL 100 or ESL 100.
Limits on Enrollment:

Transfer Credit: CSU;
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:	Transferable	Effective:	Fall 2004	Inactive:	Fall 2014
UC Transfer:		Effective:		Inactive:	

CID:

Certificate/Major Applicable:
Certificate Applicable Course

COURSE CONTENT

Outcomes and Objectives:

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

1. Differentiate among types of internal combustion engines according to their fuel source.
2. Describe the fundamentals of internal combustion engine operation including the following systems:
 - Fuel
 - Lubrication
 - Cooling
 - Intake
 - Exhaust
 - Engine Accessories
3. Represent engine systems through diagramming engine block and related components.
4. Analyze and correct the performance of each individual component as it relates to total engine operation.
5. Interpret engine disassembly instructions in a service manual in order to successfully disassemble and reassemble an engine.
6. Measure, inspect, and evaluate serviceable engine components using precision measurement tools and compare data to manufacturers' specifications.
7. Select and order engine parts using manufacturers parts systems.
8. Disassemble, inspect, evaluate, adjust, and reassemble a diesel engine as part of a team.

Topics and Scope:

1. Engine Operation Fundamentals
 - a. Engine Design
 - b. Combustion chamber design

- c. Overhaul procedures
 - d. Engine disassembly and measurements
 - e. Theory and principles of operation
- 2. Engine block, cylinder head and related components
 - a. Engine block
 - b. Crank shaft
 - c. Cam shaft
 - d. Gear train
 - e. Cylinder Head
- 3. Engine Fuel Systems
 - a. Diesel fuels and other fuels
 - b. Types of fuel systems
 - c. Fuel system operation and repair
- 4. Engine Lubrication Systems
 - a. Lubricants and lube system design
 - b. Lubrication system components
 - c. Engine block component overhaul procedures
 - d. Engine shaft evaluation and repair
- 5. Engine Cooling Systems
 - a. Coolants and additives
 - b. Cooling systems components
 - c. Cooling system evaluation and repair
 - d. Engine reassembly procedures
- 6. Engine Intake and Exhaust Systems
 - a. Intake and exhaust requirements
 - b. Intake and exhaust component repair
 - c. Engine complete reassembly
 - d. Engine troubleshooting
- 7. Measurement, Inspection, and Evaluation of Internal and External Components
- 8. Safety
 - a. Personal
 - b. Shop
 - c. Environmental

Assignment:

- 1. Assigned textbook readings, 40-60 pages per week.
- 2. Answer questions at the end of each chapter.
- 3. Perform engine cleaning, disassembly, and measurements.
- 4. Observe engine systems and evaluate for conditions related to operation.
- 5. Perform engine reassembly according to manufacturer recommendations.
- 6. Maintain a lab notebook, recording observations and procedures.
- 7. Research and prepare written (3-5 pages) and oral report on topics related to modern diesel engines.
- 8. Quizzes (2-3), midterm, final exam.

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.

Written homework, Lab reports, Term papers

Writing
20 - 40%

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

None

Problem solving
0 - 0%

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

Structured lab activities

Skill Demonstrations
30 - 50%

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

Multiple choice, True/false, Matching items

Exams
20 - 40%

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

Participation.

Other Category
10 - 20%

Representative Textbooks and Materials:

Diesel Technology: Fundamentals, Service, Repair. Norman, Corinchock, Scharff, Goodheart-Wilcox Pub. 2nd Ed., 2001.