

**DET 82B Course Outline as of Fall 2004****CATALOG INFORMATION**

Dept and Nbr: DET 82B Title: INTERNAL COMB ENG OPER

Full Title: Internal Combustion Engine Operation

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:**

Preparation and operation of live internal combustion engines. Students will perform tune-ups and diagnostic procedures and analyze specific systems related to operating engines.

**Prerequisites/Corequisites:**

Course Completion of DET 182A ( or DET 82A)

**Recommended Preparation:**

Eligibility for ENGL 100 or ESL 100.

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

Description: Preparation and operation of live internal combustion engines. Students will perform tune-ups and diagnostic procedures and analyze specific systems related to operating engines. (Grade Only)

Prerequisites/Corequisites: Course Completion of DET 182A ( or DET 82A)

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:**

<b>AS Degree:</b>	<b>Area</b>			Effective:	Inactive:
<b>CSU GE:</b>	<b>Transfer Area</b>			Effective:	Inactive:
<b>IGETC:</b>	<b>Transfer Area</b>			Effective:	Inactive:
<b>CSU Transfer:</b>	Transferable	Effective:	Fall 2004	Inactive:	Fall 2014
<b>UC Transfer:</b>		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. Summarize maintenance and repair methods related to internal combustion engines.
2. Carry out troubleshooting procedures to deduce necessary repairs and perform tune-up techniques to modify engine performance.
3. Diagram engine lubrication systems and components.
4. Evaluate engine cooling system condition and components.
5. Test for engine and intake exhaust system efficiency.
6. Identify different types of engine fuel systems.
7. Safely and successfully start, operate and evaluate the final condition of an internal combustion engine.
8. Use engine tune-up and diagnostic tools and instruments effectively.
9. Identify and name specific engine accessories.
10. Discuss and apply personal, shop, and environmental safety procedures.

### **Topics and Scope:**

#### Unit 1: Inspection and Operation

- a. Pre-operation inspection
- b. Safety checks
- c. Engine start-up
- d. Engine operation
- e. Engine shut-down procedures

#### Unit 2: Tune-up procedures

- a. Four-stroke cycle
- b. Standard tune-up procedures
- c. Electronic engine tune-up procedures
- d. Two-stroke cycle engine tune-up procedures
- e. Electronic component testing

#### Unit 3: Diagnostic procedures

- a. Mechanical fuel system diagnostics
- b. Electronic fuel system diagnostics
- c. General engine diagnostics

Unit 4: Engine accessories

- a. Engine accessories
- b. Turbocharging and Supercharging
- c. Engine brakes and retarders
- d. Heaters and coolers
- e. Adaptive housings and devices

Unit 5: Safety

- a. Personal
- b. Shop
- c. Environmental

**Assignment:**

May include:

1. Assigned textbook readings, 40-60 pages per week.
2. Answer questions at the end of each chapter.
3. Prepare, operate, test, evaluate, adjust, and re-operate 2-3 diesel engines.
4. Perform engine tune-up procedures.
5. Perform diagnostic tests and procedures.
6. Perform engine analysis and evaluation.
7. Maintain a lab notebook, recording procedures and evaluations.
8. Create a diagram of the lubrication system in a specific engine.
9. Research and prepare a written (3-5 pages) and oral report on a topic related to modern diesel engines.
10. 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.