

Plot No.1 (A), CNI Complex, Patia, Bhubaneswar - 751024, Odisha, India. [AFFILIATED TO BPUT, ODISHA] www.coeb.ac.in

DEPARTMENT OF AUTOMOBILE ENGINEERING

Name of the course : Add-on course on Modern Fuels and Alternative to IC Engines

Course code

Branch

: Automobile

Semester

: 7th

Duration

: 40 hours

Learning Objective:

* To give an overview of Internal Combustion Engines, their classification, applications, operation and processes.

* To give complete knowledge of type of fuels used in IC engines and the fuel supply systems.

* To describe combustion phenomena in IC engines.

To explain the Gas Turbine with various operating cycles.

Course Outcome:

After completion of course the students will be able to:

CO1: Understand various types of I.C. Engines, Cycles of operation and Identify fuel metering, fuel supply systems for different types of engines.

CO2: Understand combustion phenomena in SI and CI engines and Analyze the effect of various operating variables on engine performance.

CO3: Evaluate performance Analysis of IC Engine and Justify the suitability for different applications.

CO4: Understand the conventional and non-conventional fuels and effects of emission formation of IC engines, its effects and the legislation standards.

SYLLABUS

MODULE 1: (14 hours)

I.C. Engines - Classification based on multi cylinder engine, firing order, selection criteria of IC engines based on application, materials and manufacturing processes of ICE components. Fuel Supply systems of SI and CI engines - Types of carburetor (makes), Fuel supply systemsfor C.I. engines: Requirement of ideal injection system, types of injection systems, fuel pumps and injectors, types of nozzles.

MODULE 2:

(14 hours)

Testing and performance - Review of IC engine testing, and trial calculation on testing at different load characteristics, Performance characteristics such as brake thermal efficiency.

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volumetric efficiency BSFC, Economical running, Williams line, interrelationship of various engines variables, performance graphs

MODULE 3: (12 hours)

Exhaust Emission – Introduction, constituents of exhaust gas, effects on human health andcauses of formation and their measurement pollution control device and EURO standards. Alternative fuels for IC engines like LPG, CNG, Alcohols, Hydrogen etc., their need,properties, engine modification and performance

Text Book:

- 1. Heywood J.B., "Internal combustion Engine Fundamentals", McGraw Hill, 1988
- 2.Obert E.F., "Internal combustion Engine and Air Pollution", Intext Educational Pub,1974Ganesan V., "Internal combustion Engines", 6 thEd.Tata McGraw Hill Publishing Co. Domkundwar V.M. "Internal Combustion Engines"-
- 3. PulkrabekW, "Engineering Fundamentals of Internal Combustion Engine", Prentice Hall, 1997

Reference Text Book:

- 1. Fundamentals of internal combustion engines: Gill, Smith and Ziurys, Oxford and IBH
- 2. The Internal combustion Engine in theory and practice: C F Taylor, MIT Press, Cambridge3. Alternative Fuels Guidebook, Properties, Storage, Dispensing, and Vehicle Facility Modifications, Richard L. Bechtold, SAE Publications 1997.

Online resources:

- 1. https://archive.nptel.ac.in/content/syllabus_pdf/112104033.pdf
- 2. https://ocw.mit.edu/courses/2-61-internal-combustion-engines-spring-2017/

Evaluation Criteria

- Mandatory attendance of 75% for each student.
- Conduction of two internal assessments and students have to secure 50% marks in each assessment.
- Certificates will be awarded to each students fulfilling the above criteria.

Designed & developed by: Prof. Pusparanjan Swain & Prof. Rajkumar Sahu

Approved by:

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Plot No.1 (A), CNI Complex, Patia, Bhubaneswar – 751024, Odisha, India

NOTICE

Department of Automobile Engineering Add On Course 2018-2019

Ref No: COEB/AE/2018/20

Date: 04.06.2018

It is hereby informed to all the students that the Department of Automobile Engineering is going to start the following Add-on courses for Academic year 2018-2019. All the students are instructed to enroll their names for the following courses on or before 23.06.2018. The classes will be commenced from $\underline{17.07.2018}$ with timing from 5.30pm to 7.30pm. You can contact the following course co-ordinators for enrolment and any queries.

SI No.	Name of Add-on Course	Sem	Duration in hours	Name of the course co-
1	Structural System Fundamentals	3 rd	40	Dr. J. Hussain
2	Fuels and Combustion	5 th	40	Dr. Krishna
3	Modern Fuels and Alternatives to IC Engines	7 th	40	Prof. Pusparanjan Swain

Automobile Engineering Department

Colopya of Engineering Bhubaneswar

Vice Chairman

Executive Director

Principal

All Notice Board.

A.O(Admin)

All HODs

Hostel, Security

College of Engineering Bhubaneswar



ADD ON/CERTIFICATE COURSE STUDENT ENROLLMENT SHEET

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ter: 7 th	Course Code (if any):	Course Duration: 1/1 hours
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I do hereby	undertake to participate in the ab	ove mentioned add on course.
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1501219052	NEELAMANI BRAJA SUNDAR	N. B. Sundan Sasu
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1501219055	SUMESH KUMAR MISHRA	Sumeth Kumar mishra
1501219056	SATYA PRAKASH SAHOO	Satya P: Sahoo
1501219057	RINKESH KUMAR BHADRA	R.K. Bhiedra
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DEPARTMENT OF AUTOMOBILE ENGINEERING

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Certificate of Completion

has successfully completed the ADD-ON Course titled	ofAutomobile Engg.	This is to certify that Mr./Ms.
ourse titled Modern Fuels and Alternatives to IC Engine	semester Seventh bearing registration number 1501219052	NEELAMANI BRAJA SUNDAR SAHU, student of the Department

TRUE COPY

conducted at College of Engineering Bhubaneswar in the academic year_

2018-19

Course-Coordinator

Principal



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has successfully completed the ADD-ON Course titled	ofAutomobile Engg.	This is to certify that Mr./Ms.
Course titled Modern Fuels and Alternatives to IC Engine	semester Seventh bearing registration number 1501219054	SUDHANSU SEKHAR PATI , student of the Department

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2018-19

Course-Coordinator

Principal

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urse titled Modern Fuels and Alternatives to IC Engine	semester Seventh bearing registration number 1501219055	SUMESH KUMAR MISHRA, student of the Department

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2018-19

Course-Coordinator

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Sourse titled Modern Fuels and Alternatives to IC Engine	semester Seventh bearing registration number 1501219057	RINKESH KUMAR BHADRA, student of the Department

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2018-19

Course-Coordinator

Principal