



COLLEGE OF ENGINEERING BHUBANESWAR

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 systems for 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 and causes 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, 1974
- Ganesan V., “Internal combustion Engines”, 6 th Ed. Tata McGraw Hill Publishing Co. Domkundwar V.M. “Internal Combustion Engines”-
3. Pulkrabek W., “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, Cambridge
3. Alternative Fuels Guidebook, Properties, Storage, Dispensing, and Vehicle Facility Modifications, Richard L. Bechtold, SAE Publications 1997.

Online resources:

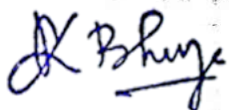
1. https://archive.nptel.ac.in/content/syllabus_pdf/112104033.pdf
2. <https://ocw.mit.edu/courses/2-61-internal-combustion-engines-spring-2017/>

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 2020-2021

Ref No: COEB/AE/2020/22

Date: 28.08.2020

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 2020-2021. All the students are instructed to enroll their names for the following courses on or before 10.09.2020. The classes will be commenced from 14/09/2020 in ON_LINE MODE from 5.30pm to 7.30pm. You can contact the following course co-ordinators for enrolment and any queries.

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

HOD

Automobile Engineering Department

Copy to:

1. Vice Chairman
2. Executive Director
3. Principal
4. All Notice Board.
5. A.O(Admin)
6. All HODs
7. Hostel, Security

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**COLLEGE OF ENGINEERING BHUBANESWAR (COEB)
ADD-ON COURSE ENROLLMENT SHEET**

ON-LINE MODE

Name of the Department: Department of Automobile Engineering

Course Title: Modern Fuels and Alternatives to IC Engine

Semester : 7th

Academic Year: 2020-21

Duration:

Student's Declaration/Undertaking

1. I do hereby undertake to participate in the above mentioned add on course.

2. I do hereby, promise to abide by the admissible rules and regulations, concerning discipline, attendance, etc. of the department, and also to follow the Code of Conduct prescribed for the students of the Institute, as in force from time to time.

Sl. No.	Registration No.	Name of the Student	Remarks by the Course Coordinator
1	1701219028	RISHA MAJHI	Certified that the Enrollment Sheet is prepared by taking the consents of the students to enroll themselves in this Certificate Course (Add-On) to be conducted in Virtual Mode (ON-LINE) during the Pandemic COVID'19 through the link provided by the Department. They have also gone through the declaration/undertaking to be strictly abided by them during the course period.
2	1701219032	DASARATHA TUDU	
3	1701219046	SOUMYARANJAN ROUDIA	
4	1701219050	YUBIN KUMAR MAREHI	
5	1701219053	GOKUL PRADHAN	
6	1701219059	AMIT PAULEY	
7	1701219064	SOUMYA RANJAN	
8	1701219075	RISHABH TRIPATHI	
9	1701219077	K AMLAN PRIYADARSHAN	
10	1701219078	SADANANDA SA	
11	1701219172	ABDUL TAJUDDIN	
12	1701219173	DEBENDRA KUMAR	
13	1701219174	DAMBURUDHAR BAG	
14	1701219175	DEBASISH NAYAK	
15	1701219208	SMRUTI BIKASH RATH	
16	1701219209	RAKESH SAMAL	
17	1701219210	SAMBIT DASH	
18	1701219211	SANTOSH KUMAR BHUYAN	
19	1701219212	ARPITAUROJIT MOHANTY	
20	1701219213	CHINMAY KUMAR BHOI	
21	1701219214	HARIHARA MAHALIK	

Course Coordinator
(Signature with Seal)



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COLLEGE OF ENGINEERING BHUBANESWAR (COEB)

DEPARTMENT OF AUTOMOBILE ENGINEERING

ADD ON/CERTIFICATE COURSE

STUDENT ATTENDANCE SHEET

ONLINE MODE

Academic Year: 2020-21

Semester: 7th Sem

Programme: B Tech in AUTOMOBILE ENGINEERING

Duration:

Name of the Course: Modern Fuels and Alternatives to IC Engine

Remarks of Course Coordinator (P-Present, A-Absent)

Remarks

Certified that this certified course is conducted in virtual mode (ON-LINE) because of the pandemic COVID-19.

The attendance is taken with the remarks P-Present and A-Absent for the students.

Sl No.	Reg. No.	Name of the Students	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date
1	1701219028	RISHA MAJHI	P	P	P	P	P	P	P	P	P	P	P	P	P	P
2	1701219032	DASARATHA TUDU	P	P	P	P	P	P	P	P	P	P	P	P	P	P
3	1701219046	SOURYARANJAN ROUDIA	P	P	P	P	P	P	P	P	P	P	P	P	P	P
4	1701219050	YUBIN KUMAR MAREHI	P	P	P	P	P	P	P	P	P	P	P	P	P	P
5	1701219053	GOKUL PRADHAN	P	P	P	P	P	P	P	P	P	P	P	P	P	P
6	1701219059	AMIT PAULEY	P	P	P	P	P	P	P	P	P	P	P	P	P	P
7	1701219064	SOURYA R. SATAPATHY	P	P	P	P	P	P	P	P	P	P	P	P	P	P
8	1701219075	RISHABH TRIPATHI	P	P	P	P	P	P	P	P	P	P	P	P	P	P
9	1701219077	K AMLAN PRIYADARSHAN	P	P	P	P	P	P	P	P	P	P	P	P	P	P
10	1701219078	SADANANDA SA	P	P	P	P	P	P	P	P	P	P	P	P	P	P
11	1701219172	ABDUL TAJUDDIN	P	P	P	P	P	P	P	P	P	P	P	P	P	P
12	1701219173	DEBENDRA K. BADANAYAK	P	P	P	P	P	P	P	P	P	P	P	P	P	P
13	1701219174	DAMBURUDHAR BAG	P	P	P	P	P	P	P	P	P	P	P	P	P	P
14	1701219175	DEBASISH NAYAK	P	P	P	P	P	P	P	P	P	P	P	P	P	P
15	1701219208	SMRUTI BIKASH RATH	P	P	P	P	P	P	P	P	P	P	P	P	P	P
16	1701219209	RAKESH SAMAL	P	P	P	P	P	P	P	P	P	P	P	P	P	P
17	1701219210	SAMBIT DASH	P	P	P	P	P	P	P	P	P	P	P	P	P	P
18	1701219211	SANTOSH KUMAR BHUYAN	P	P	P	P	P	P	P	P	P	P	P	P	P	P
19	1701219212	ARPITA UROJIT MOHANTY	P	P	P	P	P	P	P	P	P	P	P	P	P	P
20	1701219213	CHINMAY KUMAR BHOI	P	P	P	P	P	P	P	P	P	P	P	P	P	P
21	1701219214	HARIHARA MAHALIK	P	P	P	P	P	P	P	P	P	P	P	P	P	P

[Signature]



[Signature]
Course Coordinator
(Signature with Seal)



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[Signature]

DEPARTMENT OF AUTOMOBILE ENGINEERING
ADD ON/CERTIFICATE COURSE
STUDENT ATTENDANCE SHEET

Academic Year: 2020-21

ONLINE MODE

Semester: 7th Sem

Programme: B Tech in AUTOMOBILE ENGINEERING

Remarks

Name of the Course: Modern Fuels and Alternatives
to IC Engine

Remarks of Course Coordinator (P-Present, A-Absent)

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Sl No.	Reg. No.	Name of the Students	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date	Date
1	1701219028	RISHA MAJHI	P	P	P	P	P	P	P	P	P	P	P	P
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3	1701219046	SOURYARANJAN ROUDIA	P	P	P	P	P	P	P	P	P	P	P	P
4	1701219050	YUBIN KUMAR MAREHI	P	P	P	P	P	P	P	P	P	P	P	P
5	1701219053	GOKUL PRADHAN	P	P	P	P	P	P	P	P	P	P	P	P
6	1701219059	AMIT PAULEY	P	P	P	P	P	P	P	P	P	P	P	P
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8	1701219075	RISHABH TRIPATHI	P	P	P	P	P	P	P	P	P	P	P	P
9	1701219077	K AMLAN PRIYADARSHAN	P	P	P	P	P	P	P	P	P	P	P	P
10	1701219078	SADANANDA SA	P	P	P	P	P	P	P	P	P	P	P	P
11	1701219172	ABDUL. TAJUDDIN	A	A	P	P	P	P	P	P	P	P	P	P
12	1701219173	DEBENDRA K. BADANAYAK	P	P	P	P	P	P	P	P	P	P	P	P
13	1701219174	DAMBURUDHAR BAG	P	P	P	P	P	P	P	P	P	P	P	P
14	1701219175	DEBASISH NAYAK	P	P	P	P	P	P	P	P	P	P	P	P
15	1701219208	SMRUTI BIKASH RATH	P	P	P	P	P	P	P	P	P	P	P	P
16	1701219209	RAKESH SAMAL	P	P	P	P	P	P	P	P	P	P	P	P
17	1701219210	SAMBIT DASH	P	P	P	P	P	P	P	P	P	P	P	P
18	1701219211	SANTOSH KUMAR BHUYAN	P	P	P	P	P	P	P	P	P	P	P	P
19	1701219212	ARPITAURJOIT MOHANTY	P	P	P	P	P	P	P	P	P	P	P	P
20	1701219213	CHINMAY KUMAR BHOI	P	P	P	P	P	P	P	P	P	P	P	P
21	1701219214	HARIHARA MAHALIK	P	P	P	P	P	P	P	P	P	P	P	P



Course Coordinator
(Signature with Seal)

[Signature]



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Certificate of Completion


This is to certify that Mr./Ms. SAMBIT DASH, student of the Department


of Automobile Engg. semester Seventh bearing registration number 1701219210


has successfully completed the ADD-ON Course titled Modern Fuels and Alternatives to IC Engine

conducted at College of Engineering Bhubaneswar in the academic year 2020-21.

TRUE COPY


Course-Cordinator


Principal


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Certificate of Completion

This is to certify that Mr./Ms. SANTOSH KUMAR BHUYAN, student of the Department
of Automobile Engg. semester Seventh bearing registration number 1701219211
has successfully completed the ADD-ON Course titled Modern Fuels and Alternatives to IC Engine
conducted at College of Engineering Bhubaneswar in the academic year 2020-21.

TRUE COPY


Course-Coordinator


Principal


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Certificate of Completion


This is to certify that Mr./Ms. ARPITAUROJIT MOHANTY, student of the Department


of Automobile Engg. semester Seventh bearing registration number 1701219212


has successfully completed the ADD-ON Course titled Modern Fuels and Alternatives to IC Engine

conducted at College of Engineering Bhubaneswar in the academic year 2020-21.

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Course-Coordinator


Principal


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Certificate of Completion

This is to certify that Mr./Ms. CHINMAY KUMAR BHOI, student of the Department


of Automobile Engg. semester Seventh bearing registration number 1701219213


has successfully completed the ADD-ON Course titled Modern Fuels and Alternatives to IC Engine

conducted at College of Engineering Bhubaneswar in the academic year 2020-21.

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 Course-Coordinator


 Principal


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Certificate of Completion


This is to certify that Mr./Ms. HARIHARA MAHALIK, student of the Department


of Automobile Engg. semester Seventh bearing registration number 1701219214


has successfully completed the ADD-ON Course titled Modern Fuels and Alternatives to IC Engine

conducted at College of Engineering Bhubaneswar in the academic year 2020-21.

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 Course-Coordinator


 Principal


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