

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 Fuels and Combustion

Course code

Branch

: Automobile

Semester

: 5<sup>th</sup>

Duration

: 40 hours

## Learning Objective:

- \* To provide student with an opportunity to develop technical competency in automobile engineering.
- To provide students an understanding of the combustion system in vehicles.
- \* To have an understanding about supercharging and Turbo charging.
- To provide students a general idea about trouble shooting.

## Course Outcome:

After completion of course the students will be able to:

CO1: Understand the fundamentals and importance of engines, engine components, fuel parameters and advancement in technology.

CO2: Examine the aspects of maintenance and testing.

CO3: Understanding about the advanced techniques and tools used.

CO4: Explain the effects of exhaust emission on human health and various pollution norms.

## SYLLABUS

## MODULE 1:

## IC Engines Combustion Performance Parameters:

Fuels and suitability of fuels for use in S.I. Engines, Rating of S.I. Engines fuels, Carburetors and carburetion, Performance characteristics, Direct Injection Stratified Charge engines (DISC).

Homogeneous charge CI engines (HCCI), Supercharging and Turbo charging, Digital simulation for performance prediction.

## MODULE 2:

(14 hours)

Fuel system, Fuel tank, Fuel pump, Fuel injection, Exhaust, Catalytic converter, Engine cooling systems, Muffler/Silencers, Advanced techniques and tools used, Maintenance documentation,

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Trouble shooting and service procedures, Tools and equipment for repair and Overhaul, Testing equipments.

MODULE 3: (12 hours)

Fundamentals of thermochemistry, Combustion air calculation, Calculation of calorific value of fuels, Adiabatic flame temperature calculation, Mechanism and kinetics of combustion, Flame properties, Combustion burners, Combustion furnaces, Internal combustion engines, Cracking, Thermal cracking, Visbreaking, Catalytic cracking, Hydrotreatment, dewaxing, deasphalting.

## Text Book:

- 1. Modern Petroleum Technology, Vol 1, Upstream, Ed. by Richard A. Dave, IP, 6th ed., John Wiley & Sons. Ltd.
- 2. Modern Petroleum Technology, Vol 2, Downstream, Ed. by Alan G. Lucas, IP, 6th ed., John Wiley & Sons. Ltd.
- 3. Combustion, Irvin Glassman, 2nd ed., Academic Press.

## Reference Text Book:

- 1. Modern Petroleum Refining Processes, B.K.Bhaskar Rao, 4th ed., Oxford & IBH Publishing Co.Pvt. Ltd.
- 2. Report on the project "Coal Combustion Study", sponsored by Tata Tron and Steel Company Ltd., Jamshedpur.
- 3. Fuels Combustion and Furnaces, John Griswold, Mc-Graw Hill Book Company Inc

## Online resources:

- 1. https://archive.nptel.ac.in/courses/103/105/103105110/
- 2. https://www.classcentral.com/course/youtube-fundamentals-of-combustion-i-92342

## 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: Dr. J Hussain & S. Soumya Ranjan Baliarsingh

Approved by:

College of Engineering Bhubaneswar



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 <u>Academic year 2020-2021</u>. 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  $\underline{14/09/2020}$  in ON\_LINE MODE from 5.30pm to 7.30pm. You can contact the following course co-ordinators for enrolment and any queries.

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

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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: Fuels and Combustion

Semester: 5th 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	1801219010	ANMOL KULLU	
2	1801219030	BIJAYA KUMAR MAJHI	Certified that the Enrollment Sheet is prepared by
3	1801219048	DIBYA RANJAN MOHARANA	taking the consents of the students to enroll themselves in this Certificate Course (Add-On) to
4	1801219053	GAUTAM MOHANTY	be conducted in Virtual Mode (ON-LINE) during
5	1801219060	JAGANNATH MUNDA	the Pandemic COVID'19 through the link provided
6	1801219072	LOKESH KUMAR PANDA	by the Department.
7	1801219090	NIHAR RANJAN JENA	They have also gone through the declaration/
8	1801219115	RAJKUMAR TARAI	undertaking to be strictly abided by them during
9	1801219135	SATYAM SRINIBAS MANIA	the course period.
10	1801219174	YASABANTA DAS	
11		ADITYA NARAYAN SAHOO	
12	1801219176	BACHAN BHOI	
13	1801219177	DEVENDER KUMAR KISHAN	
14		PRIYANKA CHATURVEDI	
15	1801219179	RAJAT RANJAN PANDA	
16	1801219180	SIDHARTH SANKAR SAHU	
17	1801219181	SOUMYA RANJAN NATH	
18	1801219182	SUBHANKAR MOHANTY	
19	1801219183	UTKAL KESHARI JENA	
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			Course Coordinator
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	f the Course	Name of the Course: Fuels and Combustion
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1	1801219010	1801219010 ANMOL KULLU
2	180121903	1801219030 BIJAYA KUMAR MAJHI
w	180121904	1801219048 DIBYA RANJAN MOHARANA
4	180121905	1801219053 GAUTAM MOHANTY
5	180121906	1801219060 JAGANNATH MUNDA
6	180121907	1801219072 LOKESH KUMAR PANDA
7	180121909	1801219090 NIHAR RANJAN JENA
<b>∞</b>	180121911	1801219115 RAJKUMAR TARAI
9	180121913	1801219135 SATYAM SRINIBAS MANIA
10	180121917	1801219174 YASABANTA DAS
11	180121917	1801219175 ADITYA NARAYAN SAHOO
12	180121917	1801219176 BACHAN BHOI
13	180121917	1801219177 DEVENDER KUMAR KISHAN
14	180121917	1801219178 PRIYANKA CHATURVEDI
15	180121917	1801219179 RAJAT RANJAN PANDA
16	180121918	1801219180 SIDHARTH SANKAR SAHU
17	180121918	1801219181 SOUMYA RANJAN NATH
18	180121918	1801219182 SUBHANKAR MOHANTY
		1801219183 UTKAL KESHARI JENA

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2	1801219030	1801219030 BIJAYA KUMAR MAJHI	2	A	P	2	P	7	, 7		, T	3	COVID-19.
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17	1801219181	1801219181 SOUMYA RANJAN NATH	P	2	P	0	7	7	0	3	2 1	3	(Signature with Seal)
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COLLEGE OF ENGINEERING BHUBANESWAR (COEB)



PLOT NO-1(A), CNI COMPLEX, PATIA, BHUBANESWAR, KHORDHA, ODISHA-751024





# Certificate of Completion

has successfully completed the ADD-ON Course titled	ofAutomobile Engg.	This is to certify that Mr./Ms.
e titled Fuels and Combustion	semester Fifth bearing registration number 1801219010	ANMOL KULLU, student of the Department

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conducted at College of Engineering Bhubaneswar in the academic year\_

2020-21

Course-Coordinator

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Principal

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# Certificate of Completion

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conducted at College of Engineering Bhubaneswar in the academic year\_

2020-21

Course-Coordinator

Principal

PRINCIPAL College of Engineering Bhubaneswan



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# Octificate of Completion

has successfully completed the ADD-ON Course titled	of Automobile Engg.	This is to certify that Mr./Ms.
ourse titled Fuels and Combustion	semester Fifth bearing registration number 1801219048	DIBYA RANJAN MOHARANA, student of the Department

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conducted at College of Engineering Bhubaneswar in the academic year\_

2020-21

Course-Coordinator

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Principal

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# Certificate of Completion

f Automobile Engg.	This is to certify that Mr./Ms.
semester Fifth bearing registration number 1801219053	GAUTAM MOHANTY , student of the Department
	semester_Fifthbearing registration

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conducted at College of Engineering Bhubaneswar in the academic year\_

2020-21

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# Certificate of Completion

has successfully completed the ADD-ON Course titled	of Automobile Engg.	This is to certify that Mr./Ms.
e titled Fuels and Combustion	semester <u>Fifth</u> bearing registration number	JAGANNATH MUNDA , st
	number 1801219060	student of the Department

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conducted at College of Engineering Bhubaneswar in the academic year\_

2020-21

Course-Coordinator

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