



GOVERNMENT POLYTECHNIC, NABARANGPUR

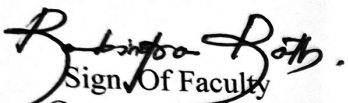
DEPARTMENT OF AUTOMOBILE ENGINEERING

Discipline: AUTOMOBILE ENGG.	Semester: 4TH	Name of the Teaching Faculty: Sri Rabindra Prasad Rath
Subject: AUTOMOTIVE ENGINE (TH-4)	No. of days/per week class allotted: 04	Semester From date: 04.02.2025 To Date: 17.05.2025 No. of Weeks: 15
COURSE OUTCOMES	CO1: Principle and working of petrol engine and diesel engine. CO2: Properties of fuel, details of combustion and control of knocking and Process of fuel being supplied to petrol & Diesel engine. CO3: Types of engine cooling and working principle of cooling system, properties, requirement of lubricants & process of lubrication and Performance of engine.	
Week	Class Day	Theory/Practical Topics
1ST	1ST	Petrol engine and its constructional details
	2ND	Working principle of two stroke & four stroke petrol engine.
	3RD	Contd.
	4TH	Constructional details of petrol engine with materials. Engine components like piston, cylinder block, valve, connecting rod, crank shaft, crank slot.
2ND	1ST	Contd.
	2ND	Cylinder arrangement: inline and v-type engine firing order of multi cylinder engine
	3RD	Cylinder arrangement: inline and v-type engine firing order of multi cylinder engine (contd.)
	4TH	Side valve actuating mechanism over head valve actuating mechanism.
3RD	1ST	Contd.
	2ND	I, F & T type valve arrangement, valve clearance.
	3RD	Contd.
	4TH	Timing gear, vibration damper, inlet & exhaust manifold.
4TH	1ST	Timing gear, vibration damper, inlet & exhaust manifold.(contd.)
	2ND	Diesel engine and its constructional details
	3RD	Working principle two strokes & four stroke diesel engine.
	4TH	Types, advantages & limitations of diesel engine over petrol engine.
5TH	1ST	Function & types of combustion chamber
	2ND	Function & types of combustion chamber (contd.)
	3RD	Direct injection type combustion chamber, pre combustion chamber
	4TH	turbulence chamber. Their advantages & disadvantages.
6TH	1ST	(Contd...)
	2ND	QUIZ AND ASSIGNMENT
	3RD	Performance of I.C engine
	4TH	Define mechanical efficiency, Indicated thermal efficiency,
7TH	1ST	Relative Efficiency, brake thermal efficiency overall efficiency
	2ND	Mean effective pressure & specific fuel consumption.

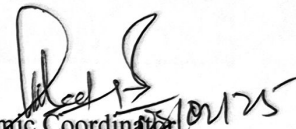
8 TH	3 RD	Define air-fuel ratio & calorific value of fuel.
	4 TH	Morse – test and preparation of heat balance sheet
	1 ST	CONTD.
	2 ND	Work out problems to determine efficiencies & specific fuel consumption
9 TH	3 RD	CONTD.
	4 TH	QUIZ AND ASSIGNMENT
	1 ST	Fuel feed system for petrol & diesels engine
	2 ND	Line diagram of petrol engine fuel supply system.
	3 RD	Components of petrol engine fuel supply system like fuel tanks, fuel lines, fuel pumps, (mechanical & electrical) fuel filter.
10 TH	4 TH	CONTD.
	1 ST	Requirements and working principle of carburetors. Air fuel ratios for different conditions in carburetors.
	2 ND	CONTD.
	3 RD	Circuits of various types of carburetor, like down draught carburetor ,side draught carburetor.
	4 TH	Description of motorcycle carburetor
11 TH	1 ST	line diagram of diesel engine fuel supply system.
	2 ND	Requirements and types of fuel injection system.
	3 RD	Air injection, solid injection individual pump system injection common rail system injection
	4 TH	TBL system MPFI system PFI system ECM control functions
12 TH	1 ST	Constructional details of fuel pump
	2 ND	CONTD.
	3 RD	Fuel injectors
	4 TH	Governing system of fuel: Mechanical governor pneumatics governor. Hydraulic governor.
13 TH	1 ST	CONTD.
	2 ND	Necessity & types of engine cooling.
	3 RD	Constructional details of air cooling & water cooling (thermo siphon & pump air circulation)
	4 TH	CONTD.
14 TH	1 ST	Advantages and limitations of air cooling
	2 ND	Water pump thermostat, radiator.
	3 RD	Anti-freezing and anti-corrosive additives
	4 TH	Types, requirements and properties (flash point & fire points) of lubricants.
15 TH	1 ST	Types of lubrication system gravity type, Splash type, pressure type, dry sump type, semi pressure type etc.
	2 ND	Parts of lubricating system like oil sump, oil cooler, oil filter, oil pressure gauge, oil pressure indicating light ,oil label indicator.
	3 RD	Oil filters and its types – full flow filter and bypass filter. Crank case ventilation.
	4 TH	REVISION

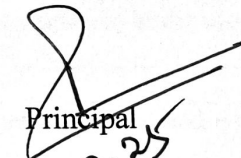
LEARNING RESOURCES:

1. Automobile engineering Vol, Vol-II by Kirpal Singh std . Publishers.
2. Automobile engineering by N.H. Crouse. Mc. Graw Hills.
3. Automobile engineering by G.B.S. Narangs, Khanna pub.
4. The automobile- by H.S.Reyat. S. Chand & Co.
5. Automobile engineering by W.H. Course. Mc Graw Hill
6. I.C. engine by Mathur and Sharma.
7. Automobile engineering by R.B. Gupta. Satya Prakashan.
8. Automobile engineering by C.P. Nakra.


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Concerned


Sign. Of HOD/IC


Academic Coordinator


Principal
22.2.25