

GOVT. POLYTECHNIC BOLANGIR
Department of Mechanical Engineering

LESSON PLAN:2025-26				
Name of the Faculty: Ashirbad Babu (Guest Faculty)				
Subject: AUTOMOBILE ENGINEERING AND HYBRID VEHICLES (TH2) Program: Diploma in Mechanical Engineering Semester: 6th Total Contact Hours: 60 Total Marks: 100 Assessment: Progressive-20, End Term-80 Credits:4				

COURSE OBJECTIVES:

At the end of the course the students will be able to:

1. Understand automobile chassis, transmission, breaking and fuel system etc.
2. Explain types of braking system and principle of operation.
3. Illustrate the automobile ignition and suspension system.
4. Explain the cooling and lubrication system of automobile.
5. Understand the fuel system and the basics of electric vehicle and hybrid vehicle.

UNIT-I: INTRODUCTION & TRANSMISSION SYSTEM (TotalClasses:10)				
Class No.	Topic	Subtopics to be Covered	Teaching Aids/ Activities	Course Objective
1	Introduction to Automobiles	Definition, need	Lecture, PPT	CO1
2	Introduction to Automobiles	classification	Lecture, PPT	CO1
3	Transmission system	Layout of automobile chassis, major components(Line diagram)	Lecture, PPT	CO1
4	Clutch System	Need, Types(Single & Multiple)	PPT, examples	CO1
5	Clutch System	Working principle with sketch	Lecture, PPT	CO1
6	Gear Box	Purpose of gearbox, Construction	Lecture, PPT	CO1
7	Gear Box	Working of a4-speed gear box	PPT, video	CO1

8	Automatic gear	Concept, changing mechanisms	Lecture	CO3
9	Propeller shaft	Constructional features	Lecture	CO3
10	Differential	Need, Types and Working principle	Lecture	CO3

UNIT-II: BRAKING SYSTEM (Total Classes: 10)

11	Braking Systems in Automobiles	Purpose of braking system	Lecture, PPT	CO2
12	Braking Systems in Automobiles	Need and types	Lecture, PPT	CO2
13	Mechanical Brake	Classification, types	Lecture, PPT	CO2
14	Hydraulic Brake	Need and types	Lecture, PPT	CO2
15	Hydraulic Brake	Principle of operation	Lecture, PPT	CO2
16	Air Brake	Purpose of braking system	Lecture, PPT	CO2
17	Air Brake	Air compressor and control valve	Lecture, PPT	CO2
18	Air assisted Hydraulic brake	Definition and components	Lecture, PPT	CO2
19	Vacuum Brake	Construction of air booster	Lecture, PPT	CO2
20	Vacuum Brake	Principle of operation	Lecture, PPT	CO2

UNIT-III: IGNITION & SUSPENSION SYSTEM (Total Classes: 10)

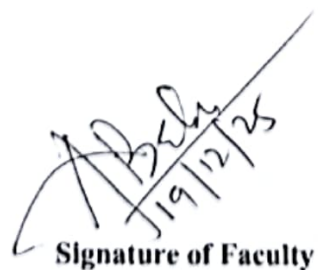
21	Ignition system	Need, Battery ignition	Lecture	CO3
22	Ignition system	Magnet ignition system	PPT	CO3
23	Sparkplugs	Purpose, construction and specifications	Lecture	CO3
24	Ignition system	Ignition troubles and its remedies	PPT	CO3
25	suspension system	Used in axels	Lecture	CO3
26	Suspension system	Rear and Front axle	Lecture	CO3

27	independent suspension system	Used in cars , spring types	Lecture, PPT	CO3
28	independent suspension system	coil spring and tension bars	Lecture, PPT	CO3
29	shock absorber	Construction	Lecture, PPT	CO3
30	shock absorber	features and working	Lecture, PPT	CO3

UNIT-IV: COOLING AND LUBRICATION (Total Classes: 15)

31	Engine cooling	Need and objective	Lecture, PPT	CO4
32	Engine cooling	defects and their remedial measures	Lecture, PPT	CO4
33	Engine cooling	Effect, Liquid cooling system	Lecture, PPT	CO4
34	Engine cooling	Coolants used, radiator	Lecture, PPT	CO4
35	Engine cooling	Cooling system maintenance	Lecture, PPT	CO4
36	Engine cooling	Common faults and their remedies	Lecture, PPT	CO4
37	Engine cooling	Modern engine cooling technology	Lecture, PPT	CO4
38	Engine cooling	Electric fans and ECU-controlled cooling	Lecture, PPT	CO4
39	lubrication	Need , definition	Lecture, PPT	CO4
40	lubrication	Types, classification	Lecture, PPT	CO4
41	lubrication	Used areas, function	Lecture, PPT	CO4
42	lubrication	Properties, additive used, system	Lecture, PPT	CO4
43	lubrication	Used in IC engine	Lecture, PPT	CO4
44	lubrication	Selection of lubricants for IC engine	Lecture, PPT	CO4
45	lubrication	Testing and evaluation	Lecture, PPT	CO4

UNIT-V: FUEL SYSTEM (Total Classes: 10)				
46	Air fuel ratio	What is AFR, Formula	Lecture, PPT	CO5
47	Petrol Engine	Carburetion process	Lecture, PPT	CO5
48	fuel injection	Multipoint fuel injection system for Petrol Engine	Lecture, PPT	CO5
49	fuel injection	working principle for multi cylinder Engine	Lecture, PPT	CO5
50	fuel injection	working principle for diesel Engine	Lecture, PPT	CO5
51	fuel injection	Classification	Lecture, PPT	CO5
52	fuel injection	Fuel injection pumps	Lecture, PPT	CO5
53	Fuel feed pump	working principle	Lecture, PPT	CO5
54	Fuel Injector	Used in Diesel engine	Lecture, PPT	CO5
55	Fuel Injector	Used areas, examples	Lecture, PPT	CO5
UNIT-Vi: ELECTRIC AND HYBRID VEHICLES (Total Classes: 5)				
56	Hybrid and Electric Vehicles	Introduction, Social and Environmental importance	Lecture	CO5
57	Electric Vehicles	operational advantages, present performance and applications	Lecture	CO5
58	Hybrid vehicles, solar	Types, powered vehicles	Q&A	CO1-CO5
59	Revision & Evaluation	Overall revision and interaction	Q&A	CO1-CO5
60	Revision & Evaluation	Overall revision and interaction	Q&A	CO1-CO5


 Signature of Faculty

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 HoD
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