"PVC" NSSK Govt. Polytechnic Bilaspur at Kalol
Lecture Planning (Theory)

Branch : **Electrical Engg.** Semester: **5th**

Subject : **Electric Vehicles** Session: **Aug 25 - Dec 25**

Teacher : **Vineeta Sharma** Cass Room : **LT9**

Sr. No.	No. of Lectures	Chapter/ Unit Description	Detail of Contents	Reference Resources	Rem
1.	1-10	Introduction to Hybrid Electric Vehicles	Evolution of Electric vehicles Introduction to advanced Electric drive vehicle technology, Vehicle types-Electric vehicles (EV), Hybrid Electric drive (HEV), Plug in Electric vehicle (PIEV), Advantages of HEV over ICE.	R1,R2,R3	
2.	11-26	Dynamics of hybrid and Electric vehicles	General description of vehicle movement Factors affecting vehicle motion - Vehicle resistance, tyre ground adhesion, rolling resistance, aerodynamic drag. Classification of motors used in Electric vehicles (brief introduction) Basic architecture of hybrid drive trains, types of HEVs, Energy saving potential of hybrid drive trains.	-do-	
3.	27-39	DC-DC Converters for EV and HEV	EV and HEV configuration based on power converters, Classification of converters – unidirectional and bidirectional, Principle of step down operation. Brief introduction of Boost and Buck- Boost converters.	-do-	
4.	40-52	DC-AC Inverter & Motors for EV and HEVs	DC-AC Converters Principle of operation of half bridge DC-AC inverter (R load, R-L load) Electric Machines used in EVs and HEVs(brief introduction), principle of operation, working of Permanent magnet motors, switched reluctance motor, applications of above motors.	-do-	
5.	53-62	Batteries used in Electric Vehicles	General description of batteries, material required for making batteries (brief introduction). Types of batteries (brief introduction) – Lithium-Ion Batteries, Nickel-Metal Hydride Batteries, Lead Acid Batteries and Ultra capacitors. Recycling of Batteries, limitations of Electric Vehicles.	-do-	

VS 01.8.25

Signature of Teacher with Date

Reference Resource:

R1: A.K. Babu, Electric & Hybrid Vehicles, Khanna Publishing House, New Delhi

R2: Fuhs, A. E. Hybrid Vehicles and the Future of Personal Transportation, CRC Press.

R3: Husain, I. Electric and Hybrid Electric Vehicles, CRC Press

"PVC" NSSK Govt. Polytechnic Bilaspur at Kalol
Practicals Planning & Coverage

Branch : **Electrical Engg.** Semester: **5th**

Subject : **Electric Vehicles Lab** Session: **Aug 25 - Dec 25**

Teacher : **Lalit Kumar** Lab :

Pract. No.	Description of Practical	Reference for Procedure/ Writeup	Likely Dates	Actual Dates	Sign
1.	Develop block diagram of Electric vehicle and identify parts.	Lab Manual			
2.	Case study- Compare minimum four vehicles for economic and environmental analysis.	Lab Manual			
3.	Develop schematic diagram of hybrid electric vehicle and identify various components.	Lab Manual			
4.	Prepare report on Plug in Electric vehicle by visiting a charging station.	Lab Manual			
5	Prepare a report on batteries used from market survey.	Lab Manual			
6	Case study- Compare various types of batteries used in electric vehicles.	Lab Manual			
7	List safety procedures and schedule for handling HEVs and EVs.	Lab Manual			

01/08/25

Signature of Teacher with Date

Signature of HOD (EE)