

LESSON PLAN SUMMER-2024

NAME OF THE TEACHING FACULTY-Mr. ZAHID AKHTAR

SUBJECT- ELECTRICAL VEHICLES SEM-6th BRANCH-ELECTRICAL ENGG.

DATE-16.01.2024 TO 26.04.2024

NO OF PERIODS AVAILABLE PER WEEK	WEEK	CHAPTER	TOPIC NAME	Period
5	WEEK-1	Introduction to Hybrid Electric Vehicles	Evolution of Electric vehicles	1
			Advanced Electric drive vehicle technology VehiclesElectric vehicles (EV)	1
			Hybrid Electric drive (HEV),	1
			Plug in Electric vehicle (PIEV),	1
			Components used Hybrid Electric Vehicle	1
4	WEEK-2		Electric hybrid vehicle Parameters affecting Environmental and Comparative study of vehicles for economic	1
			Comparative study of vehicles for environmental aspects	1
			General description of vehicle movement, Factors affecting vehicle motion- Vehicle resistance	1
5	WEEK-3	Dynamics of hybrid and Electric vehicles	tyre ground adhesion,	1
			rolling resistance,	1
			aerodynamic drag	1
			equation of grading resistance, dynamic equation	1
			Drive train configuration	1
5	WEEK-4		Automobile power train,	1
			classification of vehicle power plant	1
			Performance characteristics of IC engine	1
			electric	1
			motor, need of gear box	1
4	WEEK-5		Classification of motors used in Electric vehicles	1
			Basic	1
			architecture of hybrid drive trains	1
			types of HEVs Energy saving potential of hybrid drive	1
			,HEV Configurations-Series,	1
5	WEEK-6	DC-DC Converters for EV and HEV Applications	HEV Configurations-parallel	1
			Series-parallel, complex.	1
			EV and HEV configuration based on power converters	1
			CONT	1
			Classification of converters – unidirectional and bidirectional	1
			CONT	1
			Principle of step down operation	1
			Boost and Buck- Boost converters	1
			CONT	1
			Principle of Step-Up operation	1
			Two quadrant converters	1

5	WEEK-7		multi quadrant converters	1
			Electrical Engineering Curriculum Structure 210	1
			CONT	1
			DC-AC Converters,	1
			CONT	1
5	WEEK-8	DC-AC Inverter & Motors for EV and HEVs	Principle of operation of half bridge DC-AC inverter (R load, R-L load)	1
			Single phase Bridge DC-AC inverter with R load	1
			Single phase Bridge DC-AC inverter with R-L load	1
			Electric Machines used in EVs and HEVs	1
4	WEEK-9	Batteries	principle of operation, working & control , Permanent magnet motors, their drives	1
			switched reluctance motor,	1
			Characteristics and applications of	1
			Overview of batteries	1
			CONT	1
5	WEEK-10		Battery Parameters	1
			types of batteries	1
			CONT	1
			CONT	1
			Battery Charging	1
			CONT	1
5	WEEK-11		alternative novel energy sources-solar photovoltaic cells	1
			CONT	1
			fuel cells,	1
			CONT	1
			super capacitors	1
5	WEEK-12		flywheels	1
			Control system for EVs and HEVs	1
			CONT	1
			CONT	1
5	WEEK-13		overview of Electronic control unit ECU	1
			Details of Electronic control unit ECU	1
			Schematics of hybrid drive train	1
			control architecture Regenerative braking in EVs.	1

Prepared by
ZAHID AKHTAR

HOD OF ELECTRICAL DEPT.
G.P. SAMBALPUR