



SYNERGY SCHOOL OF ENGINEERING
DEPARTMENT OF ELECTRICAL ENGINEERING

Discipline: Electrical Engineering	Semester: - 5 TH Sem EE	Name of the teaching faculty: MR AMARENDRA BEHERA
Subject: - ELECTRIC VEHICLES	No. of Days/week class Allotted: -3	No. of weeks: -15 SESSION-2026-2027 WINTER Starting date- 01.07.2026 Closing date- 05.11.2026
No. of week	No. of class	Topic to be Taught
1	1 ST	Evolution of Electric vehicles
	2 ND	Advanced Electric drive vehicle technology Vehicles-Electric vehicles (EV),
	3 RD	Hybrid Electric drive (HEV), Plug in Electric vehicle (PIEV),
2	1 ST	Components used Hybrid Electric Vehicle
	2 ND	Economic and environmental impacts of Electric hybrid vehicle
	3 RD	Parameters affecting Environmental
3	1 ST	Parameters affecting economic analysis
	2 ND	Comparative study of vehicles for economic,
	3 RD	Comparative study of vehicles for environmental aspect
4	1 ST	General description of vehicle movement
	2 ND	Factors affecting vehicle motion- Vehicle resistance, tyre ground adhesion, rolling resistance
	3 RD	aerodynamic drag, equation of grading resistance, dynamic equation
5	1 ST	Drive train configuration, Automobile power train,
	2 ND	Performance characteristics of IC engine, electric motor, need of gear box 9 17
	3 RD	Classification of vehicle power plant
6	1 ST	Basic architecture of hybrid drive trains, types of HEVs
	2 ND	Energy saving potential of hybrid drive trains
	3 RD	HEV Configurations-Series, parallel, Series-parallel, complex.
7	1 ST	EV and HEV configuration based on power converters
	2 ND	Classification of converters –unidirectional
	3 RD	Classification of converters – bidirectional
8	1 ST	Principle of step-down operation
	2 ND	Boost and Buck- Boost converters
	3 RD	Boost and Buck- Boost converters
9	1 ST	Principle of Step-Up operation
	2 ND	Two quadrant converters; multi quadrant converter
	3 RD	Two quadrant converters; multi quadrant converter
10	1 ST	DC-AC Converters
	2 ND	Principle of operation of half bridge DC-AC inverter (R load, R-L load)
	3 RD	Principle of operation of half bridge DC-AC inverter (R load, R-L load)
11	1 ST	Single phase Bridge DC-AC inverter with R load, R-L load
	2 ND	Electric Machines used in EVs and HEVs, principle of operation
	3 RD	Electric Machines used in EVs and HEVs, working & control

Handwritten signature
01/06/2026

12	1 ST	Permanent magnet motors, their drives, switched reluctance moto
	2 ND	Permanent magnet motors, their drives, switched reluctance moto
	3 RD	Characteristics and applications of above motors
13	1 ST	Overview of batteries
	2 ND	Battery Parameters, types of batteries
	3 RD	Battery Charging, alternative novel
14	1 ST	Energy sources-solar photovoltaic cells, fuel cells, super capacitors, flywheels
	2 ND	Control system for EVs and HEVs
	3 RD	Overview, Electronic control unit ECU
15	1 ST	Schematics of hybrid drive train, control architecture
	2 ND	Schematics of hybrid drive train, control architecture
	3 RD	Regenerative braking in EVs

Amarendra Dehena
Prepared by 02.06.2026

M. M. Panda
11/06/2026

HOD EE

HOD
ELECTRICAL ENGG. DEPT.
SSE, Dhenkanal

Dehena
02.06.2026
PRINCIPAL
Synergy School of Engineering
Dhenkanal