

LESSON PLAN

(Academic Session: August.-December, 2025)

Program Name	Electrical Engineering
Course Title	Electric Vehicles
Course Code	EEPE-301-iii
Semester	5 th
Course Teacher Name	Ved Prakash Verma

Evaluation Scheme

Sr. No.	Subject Code	Subject	Study Scheme			Total Study Hours	Credits	Evaluation Scheme										Total Marks
			Th	Pr	DCS			Internal Assessment			External Assessment							
								Th	Pr	Total	Th	Hrs	Pr	Hrs	Total			
1	EEPE-301-iii	EVs	3	-	2	4	3	40	-	40	60	3	-	-	60	100		

References Books/ Study Material

1. Iqbal Husain, *Electric and Hybrid Vehicles: Design Fundamentals*, CRC Press, 2nd Edition, 2011.
2. Mehrdad Ehsani, Yimin Gao, Sebastien E. Gay, Ali Emadi, *Modern Electric, Hybrid Electric, and Fuel Cell Vehicles: Fundamentals, Theory, and Design*, CRC Press, 2nd Edition, 2009.
3. Ali Emadi, *Advanced Electric Drive Vehicles*, CRC Press, 2014.

Course Outcomes (Cos)

CO-1	Describe the evolution, classification, and advantages of EVs, HEVs, and PHEVs over conventional ICE vehicles.
CO-2	Analyze vehicle dynamics, resistances, and hybrid drivetrain architectures for energy efficiency.
CO-3	Explain the operation of DC-DC converters, DC-AC inverters, and electric machines used in EV/HEV systems.
CO-4	Evaluate batteries and energy storage systems in EVs/HEVs, including types, limitations, and recycling.

Teaching/Lecture Plan

Unit No	No. of Lect. Planed	Topic to be covered	Proposed date (as per time table)	Actual Date	Remarks
1, 2 & 4	1	Overview of course: Basic Aspects	04.08.2025		
	2	Overview of course: Environmental Aspects	05.08.2025		
	3	Overview of course: Economic/Technical Aspects	06.08.2025		
	4	Evolution of Electric vehicles	08.08.2025		
	5	Introduction to advanced Electric drive vehicle technology, & Vehicle Types	11.08.2025		
	6	Electric vehicles (EV)	12.08.2025		
	7	Hybrid Electric drive (HEV)	13.08.2025		
	8	Plugin Electric vehicle (PIEV)	18.08.2025		
	9	Advantages of HEV over IC, limitations of Electric Vehicles	19.08.2025		
	10	Basic architecture of hybrid drive trains,	20.08.2025		
	11	Types of HEVs	22.08.2025		
	12	Types of HEVs	23.08.2025		
	13	Energy saving potential of hybrid drive trains	25.08.2025		
	14	do-	26.08.2025		
	15	General description of vehicle movement	27.08.2025		
	16	Factors affecting vehicle motion	29.08.2025		
	17	Tyre ground adhesion, rolling resistance,	30.08.2025		

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2,3 &4	18	Aerodynamic drag, Vehicle resistance, etc.	01.09.2025		
	19	Motors for EV and HEVs	02.09.2025		
	20	Machines used in EVs and HEVs(brief introduction)	03.09.2025		
	21	Classification of motors used in Electric vehicles (brief introduction)	05.09.2025		
	22	-do-	06.09.2025		
	23	Construction, working & application of Permanent magnet motors	08.09.2025		
	24	-do-	09.09.2025		
	25	Construction, working & applications of switched reluctance motor	10.09.2025		
	26	-do-	12.09.2025		
	27	EV and HEV configuration based on power converters	15.09.2025		
	28	-do-	16.09.2025		
	29	DC-DC Converters for EV and HEV	17.09.2025		
	30	Classification of DC-DC converters	19.09.2025		
	31	Working of unidirectional DC-DC Converter	20.09.2025		
	32	Working of bidirectional DC-DC Converter	22.09.2025		
	33	Working & Circuit operation step-down DC-DC converter	23.09.2025		
	34	Working & Circuit operation boost converter	24.09.2025		
	35	Working & Circuit operation buck-boost converter	26.09.2025		
	36	DC-AC Inverter/Converter	27.09.2025		
	37	Working & Circuit operation half bridge DC-AC converter with R- load	29.09.2025		
	38	-do-	30.09.2025		
	39	Working & Circuit operation half bridge DC-AC converter with R-L load	01.10.2025		
	40	-do-	03.10.2025		
5	41	General description of batteries	04.10.2025		
	42	Material required for making batteries (brief introduction).	06.10.2025		
	43	Types of batteries (brief introduction)	08.10.2025		
	44	Lead Acid Batteries	10.10.2025		
	45	Lithium-Ion Batteries,	13.10.2025		
	46	Nickel-Metal Hydride Batteries	14.10.2025		
	47	Ultra capacitors	15.10.2025		
	48	Recycling of Batteries	21.10.2025		
	49	Revision/seminar by students topic wise	22.10.2025		
	50	-do-	24.10.2025		
	51	-do-	25.10.2025		
	52	-do-	27.10.2025		
	53	-do-	28.10.2025		
	54	-do-	29.10.2025		
	55	-do-	31.10.2025		
	56	-do-	01.11.2025		
	57	-do-	03.11.2025		
	58	-do-	04.11.2025		
	59	-do-	07.11.2025		
	60	-do-	17.11.2025		
	61	-do-	18.11.2025		

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	62	-do-	19.11.2025		
	63	-do-	21.11.2025		
	64	-do-	22.11.2025		
	65	-do-	24.11.2025		
	66	-do-	25.11.2025		
	67	-do-	26.11.2025		

Home Assignments

Assignment No	Contents of Syllabus Covered	Proposed date	Actual Date	Remarks
1	Unit-1&2	30.08.2025		
2	Unit-2,3&4	01.10.2025		
3	Unit-5	22.10.2025		

Class /House Test

Name of Test	Syllabus Covered in Tests (Unit/Chapter Wise)	Proposed date	Actual Date	Remarks
Class Test-I	Unit-1&2	As per HPTSB Academic Calendar Schedule		
Class Test-II	Unit-3& 4			
House Test	80% of whole syllabus			

Signature of Course Teacher with Name


(Ved Prakash)
Head, DoEE

Approved by


Principal
ABVGIET, P/Nagar

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