LESSON PLAN

(Academic Session: August.-December, 2025)

Program Name	Electrical Engineering
Course Title	Electrical Motor & Transformer
Course Code	EEPC-213
Semester	3rd
Course Teacher Name	Ved Prakash Verma

Evaluation Scheme

Sr. No.	Subject Code	Subject	Study Scheme			Total Study Hours	Credits	Evaluation Scheme								Total Marks
								Internal Assessment			External Assessment					
			Th	Pr	DCS			Th	Pr	Total	Th	Hrs	Pr	Hrs	Total	
1	EEPC-213	EM&T	3	-	2	4	3	40	-	40	60	3	-	-	60	100

References Books/ Study Material

1. K. Murugesh Kumar, *DC Machines and Transformers* ,Vikas Publishing House, New Delhi, 1st Edition
2. Bhag S. Guru & Huseyin R. Hiziroglu, *Electric Machinery and Transformers* Oxford University Press, Edition: 3rd Edition
3. Theodore Wildi, *Electrical Machines, Drives, and Power Systems* Pearson Education (formerly Prentice Hall), 6th Edition
4. Robert D. Laramore, *An Introduction to Electrical Machines and Transformers* John Wiley & Sons 2nd Edition.

Course Outcomes (Cos)

CO-1	Describe the construction, working principles, and applications of DC machines and their components
CO-2	Analyze the performance and characteristics of DC motors and single-phase transformers using equations, phasor diagrams, and efficiency method
CO-3	Apply the knowledge of 1-phase transformer construction, connections, and selection standards
CO-4	Apply the knowledge of 3-phase transformer construction, connections, and selection standards for distribution and power applications
CO-5	Evaluate the construction, operation, and applications of special-purpose transformers under different loading and harmonic conditions.

Teaching/Lecture Plan

Unit No	No. of Lect. Planed	Topic to be covered	Proposed date (as per time table)	Actual Date	Remarks
			01.08.2025		
Prerequisites	1	Overview of course: Basic Aspects Machine			
	2	Overview of course: Basic Aspects of Rotating DC Machine with their applications	01.08.2025		
	3	Overview of course: Basic Aspects of all kinds of Transformers with their applications	04.08.2025		
Unit 1:- DC Generator	4	Constructional features of DC generator with its essential parts	06.08.2025		
	5	Materials used for Construction of DC M/c and their functions	06.08.2025		
	6	Principle of operation of DC generator	07.08.2025		
	7	Fleming's right hand rule	08.08.2025		
	8	Schematic diagrams of DC Generator and its applications	11.08.2025		
	9	e.m.f. equation of DC generator	13.08.2025		

	10	Armature reaction and their effects	13.08.2025		
	11	Commutation in DC generator	14.08.2025		
Unit-2: DC Motor		Principle of operation of DC motor	18.08.2025		
		Fleming's left hand rule,	20.08.2025		
		Back e.m.f. and its significance	20.08.2025		
	15	Voltage & Torque equations of DC motor	21.08.2025		
	16	Armature torque, Shaft torque, BHP	22.08.2025		
	17	Types of DC motors	25.08.2025		
	18	Starters: necessity, working of 2-point starter	27.08.2025		
	19	Working of 3-pont starter	27.08.2025		
	20	Speed Equation of DC Motor & control methods	28.08.2025		
	21	Armature control method of series & shunt motor	29.08.2025		
	22	Field control method of series & shunt motor	01.09.2025		
	23	Test on DC Motor: Brake Test , efficiency	03.09.2025		
	24	Loses in DC Motors	03.09.2025		
	25	BLDC: Construction & Working	04.09.2025		
Unit 3:- 1-ϕ Transformer	26	Construction of 1-ϕ transformer Parts and their functions	05.09.2025		
	27	Materials used for different parts: CRGO, CRNGO, HRGO, amorphous cores.	08.09.2025		
	28	Types of Transformer : Shell type and core type	10.09.2025		
	29	Principle of operation	10.09.2025		
	30	EMF equation of transformer and Voltage transformation ratio	11.09.2025		
	31	significance of transformer ratings	12.09.2025		
	32	Transformer No-load and on-load phasor diagram	15.09.2025		
	33	Leakage reactance, Equivalent circuit of transformer	17.09.2025		
	34	Equivalent resistance and reactance of transformer	17.09.2025		
	35	Voltage regulation and Efficiency by Direct loading test	18.09.2025		
	36	Test on Transformer: OC/SC Tests	19.09.2025		
	37	All-day efficiency, Polarity test	22.09.2025		
Unit 4:- 3-ϕ Transformer	38	Constructional Feature of 3-Phase transformer: Bank of 3- single phase transformers, Single unit of 3-phase transformer.	24.09.2025		
	39	Three phase transformers connections as per IS:2026 (part IV)-1977	24.09.2025		
	40	Types of 3-phase transformer	25.09.2025		
	41	Distribution Transformer	26.09.2025		
	42	Criteria for selection of distribution transformer as per IS: 10028 (Part I)-1985	29.09.2025		
	43	Amorphous Core type Distribution Transformer	01.10.2025		
	44	Specifications of three-phase distribution transformers as per IS:1180 (part I)- 1989	01.10.2025		
	45	Power Transformer	03.10.2025		
	46	Criteria for selection of Power transformer	06.10.2025		
	47	Difference between power & distribution transformer	08.10.2025		
	48	Three phase to two phase conversion (Scott Connection),	08.10.2025		
	49	Cooling of 3-phase transformer	09.10.2025		
	50	Need of parallel operation of three phase transformer, Conditions for parallel operation	10.10.2025		
	51	Test on Transformer : Polarity Test & Phasing out test on 3-Phase transformer	13.10.2025		
	52	Special Purpose Transformer and its types	15.10.2025		
	53	3- Phase auto transformers: Construction, working	15.10.2025		

Unit 5:- Special Purpose Transformers		and applications			
	54	3-Phase auto transformers: Construction, working and applications	22.10.2025		
	55	Instrument Transformers and its types	22.10.2025		
	56	Construction, working and applications of Current transformer	23.10.2025		
	57	Construction, working and applications of Potential transformer.	24.10.2025		
	58	Isolation transformer: Constructional Features and applications	27.10.2025		
	59	Pulse transformer: constructional features and applications	29.10.2025		
	60	Single phase welding transformer: constructional features and applications.	29.10.2025		
	61	'K' factor of transformers: overheating due to non-linear loads and harmonics	30.10.2025		
	62	Revision	31.10.2025		
	63	-do-	03.11.2025		
	64	-do-	06.11.2025		
	65	-do-	07.11.2025		
	66	-do-	17.11.2025		
	67	-do-	19.11.2025		
	68	-do-	19.11.2025		
	69	-do-	20.11.2025		
	70	-do-	21.11.2025		
	71	-do-	24.11.2025		
	72	-do-	26.11.2025		
	73	-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)
HOD(EE)

Approved by

Principal
ABVGIET, P/Nagar