



Department of Electrical Engineering

Teaching Learning and Assessment Plan

Name of Faculty: Dr. N. M. Jamadar

Semester: III

Class: SY [ELE]

Academic Year: 2024-25

Subject: ELECTRICAL MACHINE-I (BTEEC302)

Planned Duration: 01-08-2024 to 23-11-2024

Course outcome: After completing the course students will able to

- BTEEC302_1** Interpret various concepts and phenomena of single-phase transformer.
- BTEEC302_2** Discuss various aspects and phenomena of three phase transformer.
- BTEEC302_3** Relate electromechanical energy conversion principles and concept of torque production in electrical machine.
- BTEEC302_4** Illustrate construction and working of DC generators and analyses its performance.
- BTEEC302_5** Describe construction and working of DC motors and analyses its performance
- BTEEC302_6** Classify different special purpose electric machines and its applications.

Text/Reference Books:

- A. J. B. Gupta, "Theory and Performance of Electrical Machines," S. K. Kataria& Sons, New Delhi
- B. P. S .Bimbra, "Electrical Machinery", Khanna Publishers
- C. B. L. Theraja, A. K. Theraja, "A text book of Electrical Technology," S. Chand Publishers
- D. Asfaq Hussein, "Electric Machines," Danpat Rai Publisher

Unit	Lect ure No.	Lesson Plan		Durati on	Planned Date	Conduction Date	TM	TA	AT	Refere nce Book	Mapping with Outcomes	
		Content Delivery									CO	PO
I	1	Transformer construction, Ideal and practical transformer		1 Hour			LT	CB, PPT	CA MSE ESE	A,C	BTEEOE70 5B_1	1,6,7,8, 10,PSO 3
	2	Exact and approximate equivalent circuits,no load and on load operation.		1 Hour						A,C		

Vision of the Department

To emerge as a center of excellence in Electrical Engineering education producing knowledgeable, employable, and ethical engineering graduates to serve industry/society

Mission of the Department

We, at Department of Electrical Engineering, are committed to achieve our vision by-

- M1:** Preparing technically and professionally competent engineers by imparting quality education through effective teaching learning methodologies.
- M2:** Developing professional skills and right attitude among students that will help them to succeed and progress in their personal and professional career.
- M3:** Inculcating moral and ethical values in students with concern to society and environment.



Unit	Lecture No.	Lesson Plan	Duration	Planned Date	Conduction Date	TM	TA	AT	Reference Book	Mapping with Outcomes	
		Content Delivery								CO	PO
I	3	Phasor diagrams, power and energy efficiency, voltage regulation parallel operation.	1 Hour							A,C	
	4	Effect of load on power factor, Per Unit system.	1 Hour							A,C	
	5	Excitation phenomenon in transformers, switching transients.	1 Hour							A,C	
	6	Auto transformers, Variable frequency transformer, voltage and current transformers.	1 Hour							A,C	
	7	Welding transformers, Pulse transformer and applications	1 Hour							A,C	
II	8	Constructional features of three phase transformers	1 Hour							A,C	1, 8,10,PS O3
	9	Cooling methodology	1 Hour							A,C	
	10	Standard and special transformer connections	1 Hour							A,C	
	11	Phase conversion	1 Hour							A,C	
	12	Parallel operation of three phase transformers	1 Hour							A,C	
	13	Three winding transformers and its equivalent circuit	1 Hour							A,C	
	14	On load tap changing of transformers.									

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		Content Delivery								CO	PO
III	15	Modern trends in transformers, type and routine tests, standards	1 Hour			LT	CA MSE ESE	CB, PPT	A,C	BTEEOE70 5B_2	1, 8,10,PS O3
	16	Energy in a magnetic systems, field energy and mechanical force	1 Hour								
	17	Energy in singly and multiply excited magnetic systems	1 Hour								
	18	Determination of magnetic force and torque.	1 Hour								
	19	Dynamic equations of electromechanical systems	1 Hour								
IV	20	Electromechanical systems and analytical techniques	1 Hour			LT	CA ESE	CB, PPT	A,C	BTEEOE70 5B_3	1, 8,10,PS O3
	21	Construction of armature and field systems, Working, types, e.m.f equation, Armature windings	1 Hour								
	22	Characteristics and applications,	1 Hour								
	23	Building of emf, Armature reaction - Demagnetizing and Cross magnetizing mmfs and their estimation	1 Hour								
	24	Remedies to overcome the armature reaction; Commutation process	1 Hour								

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		Content Delivery								CO	PO
V	25	Causes of bad commutation and remedies, Construction of armature and field systems, Working, types, emf equation	1 Hour							A,C	
	26	Armature windings, Characteristics and applications, Building of emf, Armature reaction	1 Hour							A,C	
	27	Demagnetizing and Cross magnetizing mmfs and their estimation; Remedies to overcome the armature reaction	1 Hour							A,C	
	28	Demagnetizing and Cross magnetizing mmfs and their estimation	1 Hour							A,C	
	29	Remedies to overcome the armature reaction Commutation process, Causes of bad commutation and remedies	1 Hour							A,C	
V	30	Principles of working, Significance of back emf	1 Hour							A,C	
	31	Torque Equation, Types	1 Hour							A,C	
	32	Characteristics and Selection of DC Motors	1 Hour							A,C	
	33	Starting of DC Motors, Speed Control	1 Hour							A,C	
	34	Losses and Efficiency	1 Hour							A,C	
	35	Condition for Maximum Efficiency	1 Hour							A,C	

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		Content Delivery								CO	PO
VI	36	Braking of DC Motors	1 Hour						A,C		
	37	Effect of saturation and armature reaction on losses	1 Hour						A,C		
	38	Applications, Permanent Magnet DC Motors	1 Hour						A,C		
	39	Type and Routine test	1 Hour						A,C		
	40	Constructional details of reluctance machine	1 Hour						A,C		
	41	Variable-reluctance machines	1 Hour						A,C		
	42	Basic VRM analysis	1 Hour						A,C		
	43	Practical VRM analysis	1 Hour						A,C		
	44	Stepper motors and their analysis	1 Hour						A,C		
	45	Brushless DC motors	1 Hour						A,C		

Note: TM-Teaching Method- Lecture (LT), Laboratory Visit (LV) TA-Teaching Aids Chalk Board (CB), Power Point Presentation (PPT), Models (MD) AT- Assessment Tool-Assignments (AS), Examinations (CA, MSE, ESE), Rubrics (RB)

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Mode of Assessment

Mode	Assessment Tool	Syllabus	CO Mapped	Marks Weightage	Remark
CA	Site Visit	Unit 1 & 2	CO1, CO2	25 M	The maximum weightage shall be of 20 Marks as per University Structure
	Seminar	Unit 4,5& 6	CO4, CO5, CO6	25 M	
	Assignment	Each Unit	CO1, CO2, CO3, CO4, CO5, CO6	50 M	
MSE	Written Exam	50% of Syllabus	CO1, CO2, CO3	20M	The maximum weightage shall be of 20 Marks as per University Structure
ESE	Written Exam	On entire syllabus of Electric Machine-I (BTEEC302)	CO1, CO2, CO3, CO4, CO5, CO6	60 M	The maximum weightage shall be of 60 Marks as per University Structure

Course Coordinator

Academic Coordinator

HOD- Electrical

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