



Department of Electrical Engineering

Teaching Learning and Assessment Plan

Name of Faculty: Mr. Samarjit Singh

Subject: Electrical Machine Design (BTEEC602)

Semester: VI

Class: B.tech [ELE]

Academic Year: 2024-25

Planned Duration: 03-03-2025 to 20-06-2025

Course outcome: After completing the course students will able to

BTEEC402_1:Identify and evaluate various design considerations.

BTEEC402_2:Perform calculations and numerical analysis for the design of heating and electromagnetic components.

BTEEC402_3: Formulate and interpret the output equation to understand performance parameters of three-phase induction motors

BTEEC402_4: Analyze and design the air gap, rotor, and winding configurations of three-phase induction motors

BTEEC402_5: Analyze heat generation, temperature rise, and cooling mechanisms in electrical apparatus

BTEEC402_6: Develop transformer designs by selecting appropriate core, winding, and tank dimensions

Reference Books:

- A. Saw Haney. A. K- A Course in Electrical Machine Design (DhanpatRai)..
- B. Deshpande. M. V- A Course in Electrical Machine Design (Prentice Hall Of India).
- C. Siskind – Electrical Machine Design (McGraw Hill).Wadhva S. L.,“Electric Power System”,(Tata McGraw Hill Publications).

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.



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Unit	Lecture No.	Lesson Plan	Duration	Planned Date	Conduction Date	TM	TA	AT	Reference Book	Mapping with Outcomes	
		Content Delivery								CO	PO
I	1	Principles of design, design factors	1 Hour	03/03/2025		LT	CB, PPT	CA MSE ESE	A	BTEEC602_1	PO1,2,12
	2	limitations, Ratings, Specifications, Standards	1 Hour	04/03/2025					A		
	3	Performance and other criteria to be considered,	1 Hour	05/03/2025					A		
	4	Brief study of magnetic, electric, dielectric and other materials	1 Hour	07/03/2025					A		
	5	Introduction and advantages of various approaches of Computer Aided Designing	1 Hour	10/03/2025					A		
	6	Introduction and advantages of various approaches of Computer Aided Designing	1 Hour	11/03/2025					A		
II	7	Detailed design of heating coils, starters, chokes and lifting magnets	1 Hour	12/03/2025		LT	CB, PPT	CA MSE ESE	A	BTEEC602_2	PO1,2,3,4
	8	Numerical examples	1 Hour	14/03/2025					A		
	9	AC & DC Windings: Constructional features, types of ac windings	1 Hour	17/03/2025					A		

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		Content Delivery								CO	PO
	10	Choice and design of simple/duplex lap winding, Concept of multiplex windings and reasons for choosing them	1 Hour	18/04/2025					A		
	11	Choice and design of simple/duplex wave winding, Concept of multiplex windings and reasons for choosing them	1 Hour	19/03/2025					A		
	12	and double layer three phase AC winding (mush) with integral slots	1 Hour	21/03/2025					A		
III	13	Calculation of Ampere-Turns for flux distribution in rotating machines	1 Hour	24/03/2025		LT	CB, PPT	CA MSE ESE	A	BTEEC602_3	PO1,2,3,4, PSO2,3
	14	Calculation of Ampere-Turns for flux distribution in rotating machines,	1 Hour	25/03/2025					A		
	15	Output equation of three phase IM	1 Hour	26/03/2025					A		
	16	Specific electrical and magnetic loadings	1 Hour	28/03/2025					A		
	17	Ranges of specific loadings	1 Hour	02/04/2025					A		
	18	Turns per phase, number of stator slots	1 Hour	04/04/2025					A		

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		Content Delivery								CO	PO
	19	Calculations for main dimensions	1 Hour	07/04/2025					A		
	20	Stator design parameters	1 Hour	08/04/2025					A		
	21	Numerical examples	1 Hour	09/04/2025					A		
	22	Numerical examples	1 Hour	11/04/2025					A		
IV	23	Selection of length of air gap	1 Hour	15/04/2025		LT	CB, PPT	CA ESE	A	BTEEC602_4	PO1,2,3,4,5,12,PSO2,PSO3
	24	Factors affecting length of air gap	1 Hour	16/04/2025					A		
	25	Design of rotor, Unbalanced magnetic pull and its estimation	1 Hour	21/04/2025					A		
	26	Harmonic field effect on the performance of 3-phase induction motor	1 Hour	22/04/2025					A		
	27	Design of squirrel cage and wound rotor	1 Hour	23/04/2025					A		
	28	Design of squirrel cage and wound rotor	1 Hour	25/04/2025					A		

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		Content Delivery								CO	PO
V	29	Study of different modes of heat generation, Temperature rise and heat dissipation	1 Hour	28/04/2025		LT	CB, PPT	CA ESE	A	BTEEC602_5	PO1,2,3,4, PSO2,3
	30	Heating and Cooling cycles	1 Hour	29/04/2025					A		
	31	heating and cooling time constants, their estimation	1 Hour	30/04/2025					A		
	32	dependence and applications,Methods of cooling / ventilation of electrical apparatus	1 Hour	02/05/2025					A		
	33	Thermal resistance, radiated heat quantity of cooling medium (Coolant)	1 Hour	09/05/2025					A		
	34	Numerical examples	1 Hour	13/05/2025					A		
Unit		Lesson Plan	Duration	Planned Date	Conduction Date	TM	TA	AT	Reference Book	Msapping With Outcome	
		Content Delivery								CO	PO
VI	35	Design of Transformer: Design of distribution and power transformers	1 Hour	14/05/2025		LT	CB, PPT	CA ESE		BTEEC602_6	PO1,2,3,4, 5,12,PS O2,PSO3
	36	Types, Classification and specifications	1 Hour	16/05/2025							

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		Content Delivery								CO	PO
	37	Design and main dimensions of core	1 Hour	19/05/2025							
	38	Design and main dimensions of core, yoke, winding, tank	1 Hour	20/05/2025							
	39	Estimation of leakage reactance	1 Hour	21/05/2025							
	40	Resistance of winding, No load current	1 Hour	23/05/2025							
	41	Losses, Mechanical force developed	1 Hour	26/05/2025							
	42	Mechanical force developed during short circuits	1 Hour 1 Hour	27/05/2025							
	43	Their estimation and measures to reduce them	1 Hour	28/05/2025							
	44	Numerical examples	1 Hour	30/05/2025							

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)

Mode of Assessment

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Faculty of Engineering

Department of Electrical Engineering

Mode	Assessment Tool	Syllabus	CO Mapped	Marks Weightage	Remark
CA	Seminar	Unit 1 & 2	CO1, CO2	25 M	The maximum weightage shall be of 20 Marks as per University Structure
	Design using Modern tool	Unit 4 & 6	CO4, CO6	25 M	
	Assignment & Unit Test	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 Electrical Machine Design (BTEEC602)	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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