SWARNANDHRA
COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous)
Accredited by NBA, AICTE, NEW DELHI • Accredited by NAAC with "A" Grade – 3.32/4.00 CGPA
Recognized by UGC Under Sections 2(f) & 12 (B) of UGC Act 1956
Approved by AICTE, New Delhi, Permanent Affiliated to JNTU K, Kakinada
Seetharampuram, NARSAPUR-534 280, W.G-Dist., Andhra Pradesh

Department of Electrical and Electronics Engineering

TEACHING PLAN

Course Code	Course Title	Semester	Branches	Contact Periods/ Week	Academic Year	Date of Commencement of Semester
20EE3T03	Electrical Machines-I	B.Tech / III	EEE	6	2021-2022	06/11/2021

Course Outcomes: *After successful completion of this course, students should be able to:*

1	Explain the concepts of D.C Machines & and its applications[K2]
2	Explain Various losses taking place in D.C. Machines [K2]
3	Demonstrate the different testing methods Dc Machines [K2]
4	Explain the operation & Performance of transformer [K2]
5	Explain about performance of 3- phase transformer [K2]]

Unit	Outcome/ Bloom's Level	Topics No.	Topics/ Activity	Text Book/ Reference	Contact Hour	Delivery Method/ LMS
I	CO1: Explain the concepts of D.C Machines & and its applications[K2]	1. INTRODUCTION TO DC MACHINES				
		1.1	Introduction to dc machines.	T1,R1	1	Chalk & Talk
		1.2	Construction of dc machine.	T1,R1	1	PPT
		1.3	Principle of Operation of DC Machine	T1,R1	1	PPT
		1.4	EMF Equation of dc generator	T1,R1	1	PPT
		1.5	Types of dc machines	T1,R1	1	PPT
		1.6	Types of dc machines		1	
		1.7	application of dc generator		1	
		1.8	Significance of Back EMF	T1,R1	1	PPT
		1.9	Problem solving	T1,R1	1	PPT
		1.10	Torque equation of dc motor	T1,R1	1	PPT
		1.11	Types of DC motors	T1,R1	1	PPT
		1.12	Application of dc motors	T1,R1	1	PPT
		1.13	Problem solving .	T1,R1	1	
		1.14	Problem solving .	T1,R1	1	Tutorial Class
Content beyond syllabus (if need)			Inter poles		1	Tutorial Class
Total					15	

II	CO2: Explain Various losses taking place in D.C. Machines [K2]	2. PERFORMANCE OF D.C MACHINES				
		2.1	Armature reaction	T1,R2	1	Chalk & Talk
		2.2	Effects of Armature reaction	T1,R2	1	Chalk & Talk
		2.3	Commutation	T1,R2	1	Chalk & Talk
		2.4	Characteristics of dc generators.	T1,R2	1	
		2.5	Characteristics of dc motors.	T1,R2	1	Chalk & Talk
		2.6	Losses and efficiency of dc machine.	T1,R2	1	Chalk & Talk
		2.7	Condition for maximum efficiency.	T1,R2	1	Chalk & Talk
		2.8	Problem solving	T1,R2	1	Chalk & Talk
		2.9	Necessity of starter	T1,R2	1	Chalk & Talk
		2.10	3 point starter	T1,R2	1	
		2.11	4 point starter	T1,R2	1	Chalk & Talk
		2.12	Problem solving	T1,R2	1	Chalk & Talk
		2.13	Problem solving	T1,R2	1	Chalk & Talk
Content beyond syllabus (if need)			Remedies to reduce armature reaction	T1,R2	1	Chalk & Talk
Mini Project (if possible)						
				Total	14	
III	CO3:Demonstrate the different testing methods Dc Machines [K2]	3. TESTING OF D .C. MACHINES & SINGLE-PHASE TRANSFORMERS				
		3.1	Speed Control by Armature Voltage method	T3,R1	1	Chalk & Talk
		3.2	Speed Control by Field control method.	T3,R1	1	Chalk & Talk
		3.3	Brake Test on dc shunt motor.	T3,R1	1	Chalk & Talk
		3.4	Swinburne's Test		1	
		3.5	Types and construction of single phase transformer	T3,R1	1	PPT
		3.6	Principle of operation of single phase transformer.	T3,R1	1	Chalk & Talk
		3.7	emf equation of single phase transformer	T3,R1	1	Chalk & Talk
		3.8	operation on no load and on load with phasor diagrams	T3,R1	1	Chalk & Talk
		3.9	equivalent circuit of single phase transformer	T3,R1	1	Chalk & Talk
		3.10	Problem solving	T3,R1	1	Chalk & Talk

		3.11	Problem solving	T3,R1	1	
Content beyond syllabus (if need)			Remedies to reduce the losses in transformer	T3,R1	1	Chalk & Talk
				Total	12	
IV	CO4: Explain the operation & Performance of transformer [K2]	4. PERFORMANCE AND TESTING OF TRANSFORMERS				
		4.1	Losses and efficiency of Transformer	T2,R1, R2	1	Chalk & Talk
		4.2	Effect of variation of frequency and supply voltage on losses of transformer	T2,R1, R2	1	Chalk & Talk
		4.3	All day efficiency of transformer	T2,R1, R2	1	Chalk & Talk
		4.4	Open circuit and short circuit tests of single phase transformer.	T2,R1, R2	1	Chalk & Talk
		4.5	Sumpener's test	T2,R1, R2	1	PPT
		4.6	Parallel operation with equal voltage ratios	T2,R1, R2	1	PPT
		4.7	auto transformer	T2,R1, R2	1	Chalk & Talk
		4.8	Equivalent circuit of single phase transformer	T2,R1, R2	1	Chalk & Talk
		4.9	Comparison with two winding transformers	T2,R1, R2	1	Chalk & Talk
		4.10	Problem solving	T2,R1, R2	1	Chalk & Talk
Content beyond syllabus (if need)			Transformer design		1	
				Total	11	
V	CO5: Explain about performance of 3-phase transformer [K2]])	5. 3-PHASE TRANSFORMERS				
			Polyphone connections - Y/Y, Y/Δ	T1,T2, R1	1	
		5.1	Polyphone connections - Δ/Y, Δ/Δ and open Δ	T1,T2, R1	1	Chalk & Talk
		5.2	Third harmonics in phase voltages	T1,T2, R1	1	PPT
		5.3	Three winding transformers	T1,T2, R1	1	Chalk & Talk
		5.4	transients in switching of a three phase transformer	T1,T2, R1	1	Chalk & Talk
		5.5	off load tap changers	T1,T2, R1	1	Chalk & Talk
		5.6	on load tap changers	T1,T2, R1	1	Chalk & Talk
		5.7	Scott connection	T1,T2, R1	1	Chalk & Talk
		5.8	Problem solving	T1,T2, R1	1	Chalk & Talk
		5.9	Problem solving	T1,T2,	1	Chalk & Talk

		R1		
Content beyond syllabus (if need)	Three phase supply and load basics three phase energy meters	T1,T2, R1	1	PPT
		Total	10	
		Cumulative Proposed Periods	62	

Text Books:

S. No.	Author,Book Title, Edition, Publisher, Year of Publication
1	Nagarath.I.J and Kothari D.P,Electrical machines, Fifth edition, TMH Publishing Co.Ltd. New Delhi, 2017.
2	Abhijit Chakrabarti and Sudipta Nath, Electrical Machines,First edition McGraw Hill ,2017
3	R.K.Rajput ,Electrical Machines, Lakshmi Publications, fifth edition, 2018

Reference Books:

S. No	Authors, Book Title, Edition, Publisher, Year of Publication
1	Stephen.D.Umans,Electric Machinery, 7th edition, Mc-Graw hill ,2020
2	Bimbra P.S, Electrical Machines, second edition Kh,anna Publishers, 2017
3	J.B.Guptha ,Electrical Machines ,S.K.kotaria and sons, 2014
4	S.K.Sahadev, Electrical Machines , Cambridge University Press publications, 1st edition 2017

Web Details:

1	https://youtu.be/xsWNGcZ-jds
2	https://youtu.be/txCjJmxsdyU
3	https://youtu.be/LPcQYXjPdIQ?list=PLp6ek2hDcoNCANsWM2mw3qi0387BhfLyV
4	https://youtu.be/xvL4rYUM4kA?list=PLp6ek2hDcoNCANsWM2mw3qi0387BhfLyV
5	https://www.youtube.com/watch?v=K_S1e06FAKc&list=PLp6ek2hDcoNCANsWM2mw3qi0387BhfLyV&index=10
6	https://www.youtube.com/watch?v=Ax3b5wNk6Tc&list=PLp6ek2hDcoNCANsWM2mw3qi0387BhfLyV&index=11

		Name	Signature with Date
i.	Course Coordinator	Mrs.N.Lavanya	
ii.	Module Coordinator	Mr.B.Subramanyam	
iii.	Programme Coordinator	Mr.A.Satyanarayana	

Principal