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 & Electronics Engineering

TEACHING PLAN

Course Code	Course Title	Semester	Branch	Contact Periods/ Week	Academic Year	Date of Commencement of Semester
19EE5T01	POWER GENERATION & TRANSMISSION SYSTEMS (R19)	V	Electrical & Electronics Engineering	5	2021-2022	04-10-2021

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

1	Explain the basics of electrical power generation from conventional Energy Sources [K2]
2	Analyze the economical aspects of power generation and different tariff methods [K4]
3	Estimate the expressions for transmission line parameters(R,L,C) [K5]
4	Compare various types of transmission line (Short, medium, long) and its performance [K2]
5	Estimate the performance of overhead transmission line [K5]

Unit	Outcome/ Bloom's Level	Topics No.	Topics/ Activity	Text Book/ Reference	Contact Hour	Delivery Method/ LMS
			UNIT-1. CONVENTIONAL ENERGY SOURCES			
I	COURSE OUTCOME-I: Explain the basics of electrical power generation from conventional Energy Sources [K2]	1.1	**THERMAL POWER PLANT**: Introduction Selection of site	T1, T2,R1	1	Chalk & Talk
		1.2	General layout of a thermal power plant	T1, T2,R1	2	Chalk & Talk
		1.3	Types of boilers, economizers, super heaters	T1, T2,R1	1	Chalk & Talk
		1.4	condenses and turbines, merits and demerits- ESPs	T1, T2,R1	1	Chalk & Talk
		1.5	**HYDRO ELECTRIC PLANTS:** Introduction Selection of site,	T1, T2,R1	1	Chalk & Talk
		1.6	Layout of Hydro station	T1, T2,R1	2	Chalk & Talk
		1.7	Types of hydro stations, Merits & Demerits	T1, T2,R1	1	Chalk & Talk
		1.8	**GAS POWER PLANTS:** Introduction -Simple layout	T1, T2,R1	1	Chalk & Talk
		1.9	Combined cycle, Merits and Demerits	T1, T2,R1	1	Chalk & Talk
		1.10	**NUCLEAR POWER PLANTS:** Introduction- layout – Merits & Demerits	T1, T2,R1	1	Chalk & Talk
Content beyond syllabus			Solar, Wind ,Bio Gas Power Plant	T1,R1	1	Chalk & Talk

				Total	13	
II	COURSE OUTCOME-II: Analyze the economical aspects of power generation and different tariff methods [K4]	UNIT-II ECONOMICAL ASPECTS OF POWER PLANTS & TARIFF				
		2.1	Load curve, load duration and integrated load duration curves, discussion on economic aspects	T1, T2, R3	2	Chalk & Talk
		2.2	Connected load, maximum demand, demand factor	T1, T2, R3	1	Chalk & Talk
		2.3	load factor, diversity factor, capacity factor, utilization and plant use factor, base & Peak load plants	T1, T2, R3	2	Chalk & Talk
		2.4	Problems on Economic Aspects	T1, T2, R3	1	Chalk & Talk
		2.5	**TARIFF METHODS:** Costs of generation and their division in to fixed, semi fixed and running costs.	T1, T2, R3	1	Chalk & Talk
		2.6	Desirable characteristics of a tariff method, tariff methods: simple rate, flat rate, block rate,	T1, T2, R3	2	Chalk & Talk
		2.7	tariff methods: two part and three part, and power factor tariff methods	T1, T2, R3	1	Chalk & Talk
		2.8	problem solving on Tariff	T1, T2, R3	1	Chalk & Talk
		2.9	problem solving on Tariff	T1, T2, R3	1	Chalk & Talk
				Total	13	
III	COURSE OUTCOME-III: Estimate the expressions for transmission line parameters(R,L,C) [K5]	UNIT-III TRANSMISSION LINE PARAMETERS				
		3.1	Types of conductors	T1, R1	1	Chalk & Talk
		3.2	Calculation of resistance for solid conductors	T1, R1	1	Chalk & Talk
		3.3	Calculation of inductance for single phase	T1, R1	1	Chalk & Talk
		3.4	Calculation of inductance for Three phase, single and double circuit lines	T1, R1	1	Chalk & Talk
		3.5	concept of GMR & GMD	T1	1	Chalk & Talk
		3.6	symmetrical and asymmetrical conductor configuration with & without transposition	T2 , R3	3	Chalk & Talk

		3.7	Calculation of capacitance for 2 wire and 3 wire system with & without transposition	T2 , R3	3	Chalk & Talk
		3.8	Effect of ground on capacitance	T2 , R3	1	Chalk & Talk
		3.9	Calculations for symmetrical single and three phase, single and double circuit lines	T2 , R3	2	Chalk & Talk
		3.10	Calculations for asymmetrical single and three phase, single and double circuit lines. Bundled conductors	T2 , R3	2	Chalk & Talk
				Total	16	
IV	COURSE OUTCOME-IV: Compare various types of transmission line (Short, medium, long) and its performance [K2]	**UNIT-IV Performance of Short and Medium Length Transmission Lines:**				
		4.1	Classification of Transmission Lines Short transmission line	T1, T2, R3	1	Chalk & Talk
		4.2	Nominal-T method	T1, T2, R3	2	Chalk & Talk
		4.3	Numerical problems	T1, T2, R3	2	Chalk & Talk
		4.4	Nominal-Pie method	T1, T2, R3	2	Chalk & Talk
		4.5	Numerical problems	T1, T2, R3	1	Chalk & Talk
		4.5	A, B, C, D Constants for symmetrical & Asymmetrical networks	T1, T2, R3	1	Chalk & Talk
		4.6	Numerical problems	T1, T2, R3	1	Chalk & Talk
		4.7	Rigorous solution for long line equations	T1, T2, R3	1	Chalk & Talk
		4.8	Numerical problems	T1, T2, R3	1	Chalk & Talk
		4.9	Surge impedance & SIL of long lines	T1, T2, R3	1	Chalk & Talk
		4.10	Representation of long lines- equivalent T network model	T1, T2, R3	1	Chalk & Talk
		4.11	Representation of long lines- equivalent Pie network model	T1, T2, R3	1	Chalk & Talk
		4.12	Mathematical solution to estimate regulation and efficiency for all types of lines	T1, T2, R3	2	Chalk & Talk
				Total	17	
		UNIT-V MECHANICAL DESIGN OF TRANSMISSION LINES:				
		5.1	Skin and Proximity effects	T1, T2, R3	1	Chalk & Talk
		5.2	Description and effect	T1, T2,	1	Chalk & Talk

			on resistance of solid conductors	R3		
		5.3	Ferranti effect - Charging Current.	T1, T2, R3	1	Chalk & Talk
		5.4	Corona - Description, factors affecting the corona	T1, T2, R3	1	Chalk & Talk
V	COURSE OUTCOME-V: Estimate the performance of overhead transmission line [K5]	5.5	Critical voltages and power loss	T1, T2, R3	1	Chalk & Talk
		5.6	Numerical Problems	T1, T2, R3	1	Chalk & Talk
		5.7	Radio interference	T1, T2, R3	1	Chalk & Talk
		5.8	Sag and Tension calculations with equal heights	T1, T2, R1	1	Chalk & Talk
		5.9	Sag and Tension calculations with unequal heights	T1, T2, R1	1	Chalk & Talk
		5.10	Effects of Wind and Ice on Conductors	T1, T2, R1	2	Chalk & Talk
		5.11	Stringing chart and sag template and its applications	T1, T2, R1	1	Chalk & Talk
		5.12	Types of Insulators, Voltage distribution, string efficiency.	T1, T2, R1	3	Chalk & Talk
		5.13	Methods of improving	T1, T2, R1	2	Chalk & Talk
		5.14	Problems on Sag and Tension calculations	T1, T2, R1	1	Chalk & Talk
		5.15	Capacitance grading & Static shielding	T1, T2, R1	1	Chalk & Talk
		5.16	Numerical problems	T1, T2, R1	1	Chalk & Talk
				Total	**20**	
				Cumulative Proposed Periods	**79**	

Text Books:

S. No	Authors, Book Title, Edition, Publisher, Year of Publication
1	A J Wood and B F Wallenberg, "power generation, Operation and control" Wiley Interscience, 2nd Edition
2	M.L.Soni, P.V.Gupta, U.S.Bhatnagar, A.Chakrabarthy, A Text Book on Power System Engineering, Dhanpat Rai & Co Pvt. Ltd.
3	V K Mehta, Rohit Mehta, "Principles of Power Systems", S Chand Publications
4	S N Singh, Electyric power Generation, Transmission and Distribution, PHI Learning

Reference Books:

S. No	Authors, Book Title, Edition, Publisher, Year of Publication
1.	C.L.Wadhwa, Electrical power systems,8th Edition, New Age International (P) Limited, Publishers.
2.	Ashfaq Hussain, Electrical power System, CBS Publishers & Distributors
3	Solanki, ChetanS, Renewable Energy Technologies, PHI Learning

		Name	Signature with Date
i.	Course Coordinator	Mr.V.Madhu	01/10/24
ii.	Module Coordinator	Mr.V.Madhu	01/10/24
iii	Programme Coordinator	Mr.A.SatyaNarayana	

Principal