



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	Branches	Contact Periods/ Week	Academic Year	Date of Commencement of Semester
20EE7E02	HIGH VOLTAGE ENGINEERING	VII	EEE	6	2025-26	09-06-2025

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

1	Demonstrate the performance of high voltages with regard to different configurations of electrode systems.(K2)
2	Explicate the theory of breakdown phenomena of all types of dielectric materials.(K2)
3	Explicate the techniques of generation of AC, DC and Impulse voltages.(K2)
4	Explicate the testing of Various Non-destructive materials and electrical apparatus (K2)
5	Distinguish the techniques of testing various Equipment's used in HV Engineering. (K4)

Unit	Outcome/Bloom's Level	Topics No.	Topics/ Activity	Text Book/ Reference	Cont act Hou r	Delivery Method
I	Demonstrate the performance of high voltages with regard to different configurations of electrode systems.(K2)	1.1	Overview of HVE	T1,R1	1	Chalk and Board
		1.2	UNIT-I : Introduction to High Voltage Technology	T1,R1	1	Chalk and Board, PPT
		1.3	Electric Field Stresses	T1,R1	1	Chalk and Board, PPT
		1.4	Gas/Vacuum Insulator, liquid Dielectrics, Solids and Composites,	T1,R1	2	Chalk and Board, PPT
		1.5	Estimation and control of electric Stress	T1,R1	2	Chalk and Board, PPT
		1.6	Electric Field- Uniform and non-uniform field configuration of electrodes	T1,R1	2	Chalk and Board, PPT
		1.7	Numerical methods for electric field computation,	T1,R1	2	Chalk and Board, PPT
		1.8	Surge Voltages, Distribution & control.	T1,R1	1	Chalk and Board, PPT
Total					12	
		2.1	UNIT-II : Conduction & Breakdown In Gaseous, Liquid& Solid Dielectrics	T1, R1	1	Chalk and Board



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II	Explicate the theory of breakdown phenomena of all types of dielectric materials.(K2)	2.2	Collision process, Ionization process, Townsend's criteria of breakdown in gases	T1, R1	2	Chalk and Board
		2.3	Paschen's law	T1, R1	1	Chalk and Board
		2.4	Liquid as Insulator, Pure and commercial liquids, Breakdown in pure and commercial liquid	T1, R1	2	Chalk and Board
		2.5	Intrinsic breakdown Electromechanical breakdown	T1, R1	2	Chalk and Board, PPT
		2.6	Thermal breakdown Breakdown of solid dielectrics, composite dielectrics used in practice	T1, R1	2	Chalk and Board, PPT
Total					10	
III	Explicate the techniques of generation of AC, DC and Impulse voltages.(K2)	3.1	UNIT-III: Generation and Measurements of High Voltages & Currents Generation of high DC voltages	T1,R1	1	Chalk and Board
		3.2	Generation of high alternating voltages	T1,R1	2	Chalk and Board
		3.3	Generation of impulse voltages and currents	T1,R1	1	Chalk and Board
		3.4	Tripping and control of impulse generators.	T1,R1	1	Chalk and Board
		3.5	Measurement of high DC Voltages	T1,R1	2	Chalk and Board
		3.6	Measurement of high AC and Impulse voltages	T1,R1	1	Chalk and Board
		3.7	Measurement of high Currents-Direct	T1,R1	1	Chalk and Board
		3.8	Measurement of Alternating and Impulse	T1,R1	2	Chalk and Board
		3.9	Cathode ray oscillographs for Impulse voltage and current measurement	T1,R1	2	Problem Solving
Total Classes					13	
IV	Explicate the testing of Various Non-destructive materials and electrical apparatus (K2)	4.1	UNIT-IV : Non-Destructive Testing of Material	T1,R1	1	Chalk and Board
		4.2	Measurement of DC resistivity	T1,R1	1	Chalk and Board
		4.3	Measurement of dielectric	T1,R1	1	Chalk and



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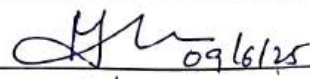

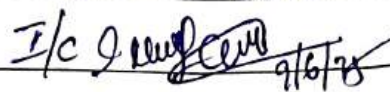
		4.4	Partial discharge measurements.	T1,R1	2	Chalk and Board	
					Total	06	
V	Distinguish the techniques of testing various Equipment's used in HV Engineering. (K4)	5.1	UNIT-V : High Voltage Testing of Electrical Apparatus Testing of insulators and bushings	T1,R1	2	Chalk and Board	
		5.2	Testing of isolators and circuit breakers	T1,R1	2	Chalk and Board	
		5.3	Testing of cables – Testing of transformers	T1,R1	2	Chalk and Board	
		5.4	Testing of surge arresters – Radio interference measurements	T1,R1	2	Chalk and Board	
		5.5	Discussion on 5 units	T1,R1	1	Chalk and Board	
					Total Classes	09	
					Overall Classes	50	

Text Books:

S. No.	Authors, Book Title, Edition, Publisher, Year of Publication
1	E.Kuffel, W.S.Zaengl, J.Kuffel , High Voltage Engineering Fundamentals ,Elsevier, 2nd Edition, 2000.
2	Ryan H U, High Voltage Engineering and Technology by, IET Publishers, 2012

Reference Books:

S. No	Authors, Book Title, Edition, Publisher, Year of Publication
1	M.S.Naidu and V. Kamaraju, High Voltage Engineering by– TMH Publications, 6th Edition, 2020.
2	Ravindra Arora and Bharat Singh Rajpurohit , Fundamentals of High voltage engineering by, Wiley India Pvt.Ltd, 2019.

		Name	Signature
i.	Course Coordinator	Dr V Madhu	
ii.	Module Coordinator	Dr V Madhu	
iii.	Programme Coordinator	Dr A Satyanarayana	


Principal
(Dr A Gopichand)