



C.U.SHAH UNIVERSITY

FACULTY OF: - Technology & Engineering
DEPARTMENT OF: -Electrical Engineering
BRANCH: Electrical Engineering
SEMESTER: - VI
COURSE:- B.Tech
CODE: - 4TE06HVE1
NAME – High Voltage Engineering

Teaching & Evaluation Scheme

Subject Code	Name of the Subject	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
		Th	Tu	Pr	Total		Theory				Practical (Marks)			Total
							Sessional Exam		University Exam		Internal		University	
							Marks	Hrs	Marks	Hrs	Pr/Viva	TW	Pr	
4TE06HVE1	High Voltage Engineering	4	0	2	6	5	30	1.5	70	3	--	20	30	150

OBJECTIVES

- To study various Electrical advance High Voltage components and methods Namely electro negative gases, time lags for breakdown, streamer theory, Paschen's law, breakdown in non uniform field, breakdown in vacuum and performance of system.
- To study design and implementation of modelling circuits using high voltage devices.
- To study design and simulation of Advance high voltage components.

PREREQUISITES

- Basics and fundamental electrical power high voltage system and analysis.

COURSE OUTLINES

Sr. No.	Course Contents	Hours
1	Break Down In Gases: Ionization processes, Townsend's criterion, breakdown in electro negative gases, time lags for breakdown, streamer theory, Paschen's law, breakdown in non uniform field, breakdown in vacuum. Breakdown In Liquid Dielectrics: Classification of liquid dielectric, characteristic of liquid dielectric, breakdown in pure liquid and commercial liquid. Breakdown In Solid Dielectrics:	10

	Intrinsic breakdown, electromechanical breakdown, breakdown of solid, dielectric in practice, breakdown in composite dielectrics.	
2	Generation Of High Voltages And Currents: Generation of high direct current voltages, generation of high alternating voltages, generation of impulse voltages, generation of impulse currents, tripping and control of impulse generators.	14
3	Measurement Of High Voltages And Currents: Measurement of high direct current voltages, measurement of high alternating and impulse voltages, measurement of high direct, alternating and impulse currents, Cathode Ray Oscillograph for impulse voltage and current measurements.	10
4	Non-Destructive Testing: Measurement of direct current resistivity, measurement of dielectric constant and loss factor, partial discharge measurements. High Voltage Testing: Testing of Insulators and Bushings, testing of Isolators and Circuit Breakers, testing of Cables, testing of Transformers, testing of Surge Arresters, leakage current monitoring test of Surge Arrester, Testing of CVT and VT, radio interference measurement.	16

Learning Outcomes

After the completion of this course the students would be able to:

1. To design mathematical computational and simulation software in electrical high voltage devices.
2. Understand the high voltage generation techniques and measurement techniques.
3. To understand advance electrical high voltage effects.

Books Recommended

1. M. S. Naidu and V. Kamaraju, "High Voltage Engineering", Tata Mc-Graw Hill.
2. E. Kuffel and W. S. Zangui, "High Voltage Engineering", Pergamon Press.
3. M. P. Chaurasia, "High Voltage Engineering", Khanna Publishers.
4. R. S. Jha, "High Voltage Engineering", Dhanpat Rai and Sons.
5. C. L. Wadhwa, "High Voltage Engineering", Wiley Eastern Ltd.
6. M. Khalifa, "High Voltage Engineering Theory and Practice", Marcel Dekker.
7. Subir Ray, "An Introduction to High Voltage Engineering", Prentice Hall of India.