

HIGH VOLTAGE ENGINEERING

Course Code	19EE4701A	Year	IV	Semester	I
Course Category	Program Elective-IV	Branch	EEE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Power systems
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Outcomes	
Upon successful completion of the course, the student will be able to	
CO1	Analyze with the generating principle of operation and design of high voltages and high currents.(L3)
CO2	Understand different methods for measurement of high voltages and high currents.
CO3	Acquaint the need for testing techniques of high voltage equipment's

Mapping of course out comes with Program outcomes(CO/PO/PSO Matrix)														
Note: 1-Weak correlation 2-Medium correlation 3-Strong correlation														
*-Average value indicates course correlation strength with mapped PO														
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	2	2	2							2	2
CO2	3	2	2	2	2	2							2	2
CO3	3	2	2	2	2	2							2	2
CO4	3	2	2	2	2	2							2	2
CO5	3	2	2	2	2	2							2	2

Syllabus		
Unit No.	Contents	Mapped CO
I	Generation of High Direct Current and Alternating Current Voltages Generation of High DC Voltages: Principle of Voltage doubler circuits, Voltage multiplier circuits and Van de Graaff Generators. Generation of High AC Voltages: Cascade transformers and resonant transformers. Generation of High-Frequency ac High Voltages: Tesla coil arrangement.	CO1
II	Generation of Impulse Voltages and Impulse Currents Generation of Impulse Voltages: Standard impulse wave shapes, Circuits for producing impulse waves and Multistage impulse generators-Marx Circuit. Generation of Impulse Currents: Circuit for producing impulse current waves, Impulse current generator and Tripping and control oh impulse generators.	CO1
III	Measurement of High Voltages Measurement of High DC Voltages: Series resistance micro ammeter, Resistance potential divider, Generating voltmeters and Sphere and other spark gaps. Measurement of High AC Voltages (Power Frequency): Series impedance ammeters, Potential dividers, Potential transformers, Electrostatic voltmeters and Sphere gaps. Measurement of High AC Voltages (High Frequency) and Impulse Voltages: Potential dividers, Peak voltmeters and sphere gaps.	CO2

IV	Measurement of High Currents: Measurement of High Direct-Currents, Measurement of High Alternating currents and Measurement of Impulse Currents	CO2
V	High-Voltage Testing of Electrical Apparatus: Testing of insulators and bushings, Testing of isolators and circuit breakers, Testing of cables, Testing of transformers, Testing of surge arresters and Radio interference measurements	CO3

Learning Resources	
Text Books	
<ol style="list-style-type: none"> 1. High Voltage Engineering by M.S.Naidu and V. Kamaraju, McGraw Hill Education (India) Private Limited, 4th Edition. 2. High Voltage Engineering by C.L.Wadhwa, New Age Internationals (P) Limited, 2nd Edition. 	
ReferenceBooks	
<ol style="list-style-type: none"> 1. High Voltage Engineering: Fundamentals by E.Kuffel, W.S.Zaengl and J.Kuffel, Elsevier, 2ndEdition. 	
e-Resources&otherdigitalmaterial	
<ol style="list-style-type: none"> 1. https://nptel.ac.in/courses/108/104/108104048/ 2. https://www.btechguru.com/courses--nptel--electrical-engineering--high-voltage-dc-transmission-video-lecture--EE--EE100024V.html 	