



National Institute of Technology Meghalaya

An Institute of National Importance

CURRICULUM

Programme	Bachelor of Technology in Electrical and Electronics Engineering	Year of Regulation	2019 – 20
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Department	Electrical Engineering	Semester	VI
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Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
EE 322	Power System Overvoltages	3	0	0	3	50	50	100	200

Course Objectives	To understand the phenomena of Overvoltage in Power System		Course Outcomes	CO1	Able to understand the occurrence of overvoltages
	To learn and analyse Lightning and switching overvoltages			CO2	Able to analyse lightning & switching transients
	To learn about the over voltage protection system			CO3	Able to design protection schemes against overvoltages
				CO4	Able to model and analyse the electrical equipments under transient condition
				CO5	
				CO6	

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1	3	0	0	0	0	0	0	0	0	0	0	0	3	0	1
2	CO2	3	3	2	1	0	1	1	0	0	0	0	0	3	0	2
3	CO3	3	3	2	1	0	1	1	0	0	0	0	0	3	1	2
4	CO4	3	2	3	1	0	1	1	0	0	0	0	0	3	1	2
5	CO5															
6	CO6															

SYLLABUS

No.	Content	Hours	COs
1	Introduction Origin and nature of power system transient and surges, Switching and Lightning overvoltage, Traveling waves	06	CO1

II	Lightning and Switching Overvoltage Lightning overvoltages: Interaction between lightning and power system- ground wire voltage and voltage across insulator. Switching overvoltage: Short line or kilometric fault, energizing transients - closing and re-closing of lines, circuit breaker; Current chopping, Capacitor switching, temporary overvoltages: line dropping, load rejection; voltage induced by fault.	14	CO1
			CO2
III	Insulation coordination and Protection Insulation coordination principles and applications, Statistical approach to insulation coordination, Protection of electrical equipments, Lightning arrestors, Surge capacitor and reactor, Grounding practice.	08	CO1
			CO3
IV	Modeling of power apparatus under overvoltage condition Overvoltage in transformer, overhead transmission lines & cables, generators & motors.	08	CO2
			CO3
			CO4
Total Hours		36	

Essential Readings

1. Allan Greenwood, "Electrical Transients in Power System", Wiley, 2nd Edition, 2016.
2. Pritindra Chowdhuri, "Electromagnetic Transients in Power Systems", Research Studies Press, 2nd Edition, 2004

Supplementary Readings

1. C. S. Indulkar, D. P. Kothari & K. Ramalingam, "Power System Transients – A Statistical Approach", PHI Learning, 2nd Edition, 2012
2. Hermann W. Dommel, *EMTP Theory Book*, Microtran Power System Analysis Corporation, 2nd Edition, 1999.
3. Neville Watson & Jos Arrillaga, "Power System Electromagnetic Transients Simulation", IET, 1st Edition, 2003