

Government Polytechnic Nawada

Department of Science & Technology, Govt. of Bihar

Lesson Plan

Name: Ajeet Kumar

Designation: Lecturer

Dept : Electrical Engg

Target Student: 5th Sem EE

Subject: Switchgear & Protection

Subject code:1620501

Subject Credits: 04

SL. No.	Name Of Unit	Lecture Sequence No.	Name of topic
1.	Unit-1 Fundamental	1	Necessity & functions of protective system
		2	Normal & abnormal conditions
		3	Types of faults & their causes
		4	Short circuit calculations(Symmetrical faults only)
		5	Use of current limiting reactors & their arrangements.
2.	Unit-2 Circuit interrupting devices	6	HRC fuses : construction, types, working, characteristics, selection and applications
		7	Isolators- vertical break, horizontal break & Pantograph type
		8	Arc formation process, methods of arc extinction, related terms
		9	Concept of Circuit breaker & Classification of Circuit breaker
		10	Working principle, Construction, Specification & Applications of Bulk oil circuit breaker
		11	Working principle, Construction, Specification & Applications of Minimum oil circuit breakers(M.O.C.B.)
		12	Working principle, Construction, Specification & Applications of Sulpher Hexa Fluoride circuit breaker (SF6)
13	Working principle, Construction, Specification & Applications of Vacuum circuit breaker		

		14	Working principle, Construction, Specification & Applications of Air circuit breakers (ACB)
		15	Miniature circuit breakers (MCB) , Moulded case circuit breakers (MCCB)
		16	Earth leakage circuit breaker (ELCB or RLCB) & Comparison of fuse & MCCB
		17	Selection of MCCB for motor & Selection and rating of circuit breakers.
3.	Unit-3 Protective Relaying	18	Requirements of Protective Relay, Terms related with Relay
		19	Classification of Protective Relays: Electromagnetic attraction, induction static, μ P based relays.
		20	Protective transformers
		21	Over current relay-Time current characteristics
		22	Static over current relays
		23	μ P based over current relays
		24	Principle of Distance relaying & static Distance relaying
		25	μ P based Distance relaying
		26	Directional relay
		27	Differential Relay
		28	Numericals based on Relay
		29	Numericals based on relay setting
4.	Unit-4 Protection of Alternator	30	Abnormalities & Faults occurs in Alternator
		31	Differential protection
		32	Overcurrent Protection
		33	Earth fault Protection
		34	Interturn fault Protection
		35	Negative phase sequence & over heating protection
		36	Reverse power protections
		37	Simple numerical on differential protection
5.	Unit-5 Protection of Transformer	38	Abnormalities & faults occurs in Transformer
		39	Differential protection
		40	Overcurrent Protection
		41	Earth fault Protection

		42	Interturn fault Protection
		43	Restricted earth fault & over heating protection
		44	Buchholz relay used for Protection of transformer
		45	Simple numerical on differential protection
6.	Unit-6 Protection of Motor	46	Abnormalities & faults occurs in Motor
		47	Short circuit protection
		48	Overload protection
		49	Single phase preventor
5.	Unit-7 Protection of Busbar & transmission line	50	Abnormalities & faults occurs in Busbar & transmission line
		51	Bus bar protection
		52	Transmission line protection
		53	Over current protection
		54	Distance protection
		55	Pilot wire protection
4.	Unit-8 Neutral Earthing	56	Introduction & importance of Neutral Earthing
		57	Types of Neutral Earthing
		58	Substation Earthing
5.	Unit-9 Over voltage Protection	59	Causes of over voltages
		60	Lighting phenomena & over voltage due to lightning
		61	Protection of transmission line & substation from direct stroke.
		62	Types of lightning arresters & surge absorbers & their Construction & principle of operation.
		63	Protection against traveling waves
		64	Insulation co-ordination

Amit Kumar

Signature of the faculty