PADMASHREE KRUTARTHA ACHARYA INSTITUTE OF ENGINEERING & TECHNOLOGY, BARGARH

LESSON PLAN

Session-2023-2024

Discipline: Electrical Engg. Semester: 6th.

Subject: Switch Gear & Protective Device

Name of the Teaching Faculty: Subesh Chandra Nayak.

Subject: Switchgear & Protective Devices No. of Days/per week class allotted : Theory - 4, Tutorial - 1

Semester From Date : 16-01-2024 To Date : 26-04-2024 No. of Weeks : 15

Week	Class Day	Theory /Practical Topics
I	1	Essential features of Switchgear.
	2	Switchgear Equipment.
	3	Bus-bar Arrangement.
	4	Switchgear Accommodation.
2	5	Short circuit
	6	Faults in a power System.
	7	Symmetrical faults on 3-phase system.
	8	Limitation of fault current.
3	9	Percentage Reactance.
	10	Percentage reactance and Base KVA.
	11	Short circuit KVA.
	12	Reactor Control of Short circuit currents.

Signature of the Faculty

Subject: Switchgear and Protective Devices No. of Days/per week class allotted Theory-4 Tutorial-1

Semester From Date : 16-01-2024 To Date : 26-04-2024 No. of Weeks : 15

Week	Class Day	Theory /Practical Topics
4	13	Location of reactors.
	14	Steps for symmetrical fault calculations
	15	Solve numericals on Symmetrical fault.
	16	Solve numericals on Symmetrical fault.
5	17	Desirable characteristics of fuse elements.
	18	Fuse element materials.
	19	Types of fuses and important terms used for fuses.
	20	Low and high voltage fuses.
6	21	Current carrying Capacity of fuse elements.
	22	Difference between a fuse and Circuit Breaker.
	23	Defination and Principle of Circuit Breaker. Arc Phenomenon & principle of Arc Extinction.
	24	Method of Arc Extinction. Defination of Arc Voltage, Restriking Voltage & Recovery voltage.

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Semester From Date : 16-01-2024 To Date : 26-04-2024 No. of Weeks : 15

Week	Class Day	Theory /Practical Topics
7	25	Classification of Circuit Breaker. Oil circuit Breaker and its Operation.
	26	Plane Break oil Circuit Breaker. Arc Control oil Circuit Breaker.
	27	Low oil Circuit Breaker.
	28	Maintenance of oil circuit Breaker.
8	29	Air Blast Circuit Breaker and its applications.
	30	Sulphur Hexafluoride (SF_6) Circuit Breaker. Vacuum Circuit Breaker.
	31	Switchgear Component. Problems of Circuit interruption.
	32	Resistance Switching Circuit Breaker Rating
9	33	Defination of protective Relay Fundamental requirement of protective relay
	34	Basic Relay operation. Electromagnetic Attractive type, Induction type
	35	Defination of pick-up Current, Current setting plug Setting Multiplier & Time setting Multiplier.
	36	Classification of functional relays, Induction type over current relay (Non-directional)

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Semester From Date : 16-01-2024 To Date : 26-04-2024 No. of Weeks : 15

Week	Class Day	Theory /Practical Topics
10	37	Induction type directional power relay.
	38	Induction type directional over current relay.
	39	Differential relay : (i) Current differential relay (ii) Voltage balance differential relay
	40	Types of protection
11	41	Protection of alternator Differential protection of alternator.
	42	Balance earth fault protection. Protection systems for Transformer.
	43	Buchholz relay. Protection of Busbar
	44	Protection of Transmission line.
12	45	Different pilot wire protection. (Merz-price voltage balance system)
	46	Explain protection of feeder by over current and earth fault relay.
	47	Voltage Surge and Causes of over voltage.
	48	Internal cause of overvoltage

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Semester From Date : 16-01-2024 To Date : 26-04-2024 No. of Weeks : 15

Week	Class Day	Theory /Practical Topics
13	49	External cause of over voltage (lightning)
	50	Mechanism of lightning discharge
	51	Types of lightning strokes
	52	Harmful effect of lightning
14	53	Lightning arrester and type of lightning arrester.
	54	Rod-gap lightning arrester.
	55	Horn-gap arrester, valve type arrester.
	56	Surge Absorber.
15	57	Static relay, Instantaneous relay.
	58	Advantages of Static relay.
	59	Instantaneous over current relay
	60	Principle of IDMT relay

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