LESSON PLAN

DEPT. OF ELECT. ENGG GOVT. POLY, BHADRAK ESTD-2017

SUB: SWITCH GEAR AND PROTECTIVE DEVICES

BRANCH:- ELECTRICAL ENGG.

SEMESTER: 6th

NAME OF FACULTY:NIBEDITA HO

GOVERNMENT POLYTECHNIC, BHADRAK

SESSION:2024-25

Hod -Electrical

03-02-25

HOD (ELECT.)
G.P.BHADRAK

Academic Co-ordinator

Academic Co-ordinator

Principal
Govt. Polytechnic, Bhadrak

Principal
Govt. Polytechnic
Bhadrak

Discipline: Electrical Engg.	Semester: 6th	Name of the Teaching Faculty :NIBEDITA HO
Subject: Switch Gear & Protective Devices	No. of Days/per week class allotted:5	Semester from date: 04.02.2025 – 17.05.2025 No. of Weeks:15
Week	**Class Day**	**Theory**
1st	1st	Essential Features of switchgear
	2nd	Switchgear Equipment.
	3rd.	Bus-Bar Arrangement
	4th	Switchgear Accommodation.
	5th	Short Circuit.
2nd	1st	Short circuit.
	2nd	Faults in a power system.
	3rd	FAULT CALCULATION Symmetrical faults on 3-phase system. Limitation of fault current.
	4th	Percentage Reactance. Percentage Reactance and Base KVA.
	5th	Short – circuit KVA.
3rd	1st	Reactor control of short circuit currents.
	2nd	Location of reactors.
	3rd	Steps for symmetrical Fault calculations.
	4th	Solve numerical problems on symmetrical fault.
	5th	FUSES Desirable characteristics of fuse element.
4th	*1st*	*Fuse Element materials.* *Types of Fuses and important terms used for fuses.*
	2nd	Low and High voltage fuses.
	3rd	Current carrying capacity of fuse element. Difference Between a Fuse and Circuit Breaker.
	4th	CIRCUIT BREAKERS Definition and principle of Circuit Breaker.
	5th	Arc phenomenon and principle of Arc Extinction.
5th	1st	Methods of Arc Extinction
	2nd	Definitions of Arc voltage, Re-striking voltage and Recovery voltage. Classification of circuit Breakers.
	3rd	Oil circuit Breaker and its classification.
	4th	Plain brake oil circuit breaker.
	5th	Plain brake oil circuit breaker.
6th	1st	Arc control oil circuit breaker.
	2nd	Low oil circuit breaker.

	4th	Maintenance of oil circuit breaker.
	5th	QUESTION DISCUSSION
7th	1st	Air-Blast circuit breaker and its classification.
	2nd	Sulphur Hexa-fluoride (SF6) circuit breaker.
	3rd	Vacuum circuit breakers.
	4th	Switchgear component.
	5th	QUESTION DISCUSSION
8th	1st	Problems of circuit interruption.
	2nd	Resistance switching. Circuit Breaker Rating.
	3rd	PROTECTIVE RELAYS Definition of Protective Relay.
	4th	Fundamental requirement of protective relay. Basic Relay operation.
	5th	QUESTION DISCUSSION.
9th	1st	Electromagnetic Attraction type Induction type
	2nd	Definition of following important terms Pick-up current, Current setting. Plug setting Multiplier,Time setting Multiplier.
	3rd	Classification of functional relays.
	4th	Induction type over current relay (Non-directional).
	5th	QUESTION DISCUSSION
10th	1st	Induction type directional power relay.
	2nd	Induction type directional over current relay.
	3rd	Differential relay Current differential relay
	4th	Voltage balance differential relay.
	5th	QUESTION DISCUSSION
11th	1st	Types of protection
	2nd	PROTECTION OF ELECTRICAL POWER EQUIPMENT AND LINES Protection of alternator.
	3rd	Differential protection of alternators.
	4th	Balanced earth fault protection.
	5th	QUESTION DISCUSSION

12th	1st	Protection systems for transformer.
	2nd	Buchholz relay.
	3rd	Protection of Bus bar.
	4th	Protection of Transmission line.
	5th	QUESTION DISCUSSION
13th	1st	Different pilot wire protection (Merz-price voltage Balance system)
	2nd	Explain protection of feeder by over current and earth fault relay.
	3rd	Voltage surge and causes of over voltage.
	4th	Internal cause of over voltage.
	5th	QUESTION DISCUSSION
14th	1st	External cause of over voltage (lightning)
	2nd	Mechanism of lightning discharge.
	3rd	Types of lightning strokes. Harmful effect of lightning.
	4th	Lightning arresters and Type of lightning Arresters. Rod-gap lightning arrester. Horn-gap arrester. Valve type arrester.
	5th	QUESTION DISCUSSION
15th	1st	Surge Absorber.
	2nd	Static relay.Advantage of static relay.
	3rd	Instantaneous over current relay.
	4th	Principle of IDMT relay.
	5th	QUESTION DISCUSSION

02.25

Signature of Faculty

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