

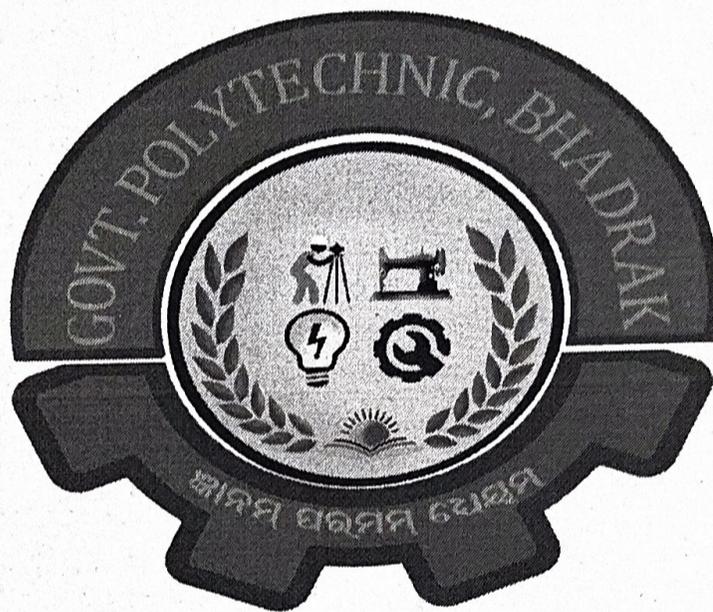
LESSON PLAN

SUB: SWITCH GEAR AND PROTECTIVE DEVICES

BRANCH:- ELECTRICAL ENGG.

SEMESTER: 6th

NAME OF FACULTY: NIBEDITA HO



**GOVERNMENT POLYTECHNIC,
BHADRAK**

SESSION: 2025-26

Doh
Hod, Electrical
19-12-25

HOD (ELECT.)
G.P. BHADRAK

Academic Co-ordinator
19.12.25

Academic Co-ordinator

Principal
Govt. Polytechnic, Bhadrak
19.12.25

Principal
Govt. Polytechnic
Bhadrak

Discipline: Electrical Engg.	Semester: 6 th	Name of the Teaching Faculty :NIBEDITA HO
Subject: Switch Gear & Protective Devices	No. of Days/per week class allotted:5	Semester from date: 22.12.2025 - 18.04.2026
Week	Class Day	No. of Weeks:15
		Theory
1 st	1 st	Essential Features of switchgear
	2 nd	Switchgear Equipment.
	3 rd	Bus-Bar Arrangement
	4 th	Switchgear Accommodation.
	5 th	Short Circuit.
2 nd	1 st	Short circuit.
	2 nd	Faults in a power system.
	3 rd	FAULT CALCULATION Symmetrical faults on 3-phase system. Limitation of fault current.
	4 th	Percentage Reactance. Percentage Reactance and Base KVA.
	5 th	Short – circuit KVA.
3 rd	1 st	Reactor control of short circuit currents.
	2 nd	Location of reactors.
	3 rd	Steps for symmetrical Fault calculations.
	4 th	Solve numerical problems on symmetrical fault.
	5 th	FUSES Desirable characteristics of fuse element.
4 th	1 st	<i>Fuse Element materials.</i> <i>Types of Fuses and important terms used for fuses.</i>
	2 nd	Low and High voltage fuses.
	3 rd	Current carrying capacity of fuse element. Difference Between a Fuse and Circuit Breaker.
	4 th	CIRCUIT BREAKERS Definition and principle of Circuit Breaker.
	5 th	Arc phenomenon and principle of Arc Extinction.
5 th	1 st	Methods of Arc Extinction
	2 nd	Definitions of Arc voltage, Re-striking voltage and Recovery voltage. Classification of circuit Breakers.
	3 rd	Oil circuit Breaker and its classification.
	4 th	Plain brake oil circuit breaker.
	5 th	Plain brake oil circuit breaker.
6 th	1 st	Arc control oil circuit breaker.
	2 nd	Low oil circuit breaker.

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

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

JNB
19.12.25
Signature of faculty

Lect.in Elect.Engg.
Govt.Poly.Bhadrak