



Department of Electrical Engineering Govt. Polytechnic Jajpur, Ragadi

LESSON PLAN FOR ACADEMIC SESSION – 2024 - 25 SWITCH GEAR AND PROTECTIVE DEVICES

Course Code : TH.4	Semester : 6TH
Total Periods : 75(60+15) Periods	Examination : 3 Hours
Theory Periods : 4 P/Week	Internal Assessment : 20 Marks
Tutorial : 1 P/Week	End Semester Examination : 80 Marks
Maximum Marks : 100	
Semester From Date : 04/02/2025 To Date : 17/05/2025	
Name of Teaching Faculty: Mrs. SUBHRASHREE DASH	

WEEK	PERIOD	TOPIC
1 st	1 st	INTRODUCTION TO SWITCHGEAR 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	Faults in a power system.
	2 nd	FAULT CALCULATION Symmetrical faults on 3-phase system.
	3 rd	Limitation of fault current
	4 th	Percentage Reactance.
	5 th	Percentage Reactance and Base KVA.
3 rd	1 st	Short – circuit KVA.
	2 nd	Reactor control of short circuit currents.
	3 rd	Location of reactors.
	4 th	Steps for symmetrical Fault calculations.
	5 th	Solve numerical problems on symmetrical fault.

4 th	1 st	Solve numerical problems on symmetrical fault.
	2 nd	FUSES Desirable characteristics of fuse element.
	3 rd	Fuse Element materials. Types of Fuses and important terms used for fuses.
	4 th	Low and High voltage fuses
	5 th	Low and High voltage fuses Current carrying capacity of fuse element.
5 th	1 st	Difference Between a Fuse and Circuit Breaker.
	2 nd	CIRCUIT BREAKERS Definition and principle of Circuit Breaker.
	3 rd	Arc phenomenon and principle of Arc Extinction.
	4 th	Methods of Arc Extinction
	5 th	Definitions of Arc voltage, Re-striking voltage and Recovery voltage.
6 th	1 st	Classification of circuit Breakers.
	2 nd	Oil circuit Breaker and its classification.
	3 rd	Plain brake oil circuit breaker.
	4 th	Arc control oil circuit breaker
	5 th	Low oil circuit breaker
7 th	1 st	Maintenance of oil circuit breaker
	2 nd	Air-Blast circuit breaker and its classification.
	3 rd	Sulphur Hexa-fluoride (SF6) circuit breaker
	4 th	Vacuum circuit breakers.
	5 th	Switchgear component
8 th	1 st	Problems of circuit interruption
	2 nd	Resistance switching.
	3 rd	Circuit Breaker Rating
	4 th	PROTECTIVE RELAYS Definition of Protective Relay.
	5 th	Fundamental requirement of protective relay.
9 th	1 st	Basic Relay operation a) Electromagnetic Attraction type
	2 nd	b) Induction type
	3 rd	Definition of following important terms
	4 th	Definition of following important terms. a) Pick-up current. b) Current setting.
	5 th	c) Plug setting Multiplier. d) Time setting Multiplier.
10 th	1 st	Classification of functional relays
	2 nd	Induction type over current relay (Non-directional)
	3 rd	Induction type directional power relay.
	4 th	Induction type directional over current relay.
	5 th	Differential relay a) Current differential relay
11 th	1 st	b) Voltage balance differential relay.
	2 nd	Types of protection
	3 rd	PROTECTION OF ELECTRICAL POWER

		EQUIPMENT AND LINES Protection of alternator.
	4 th	Differential protection of alternators.
	5 th	Balanced earth fault protection.
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	Different pilot wire protection (Merz-price voltage Balance system)
13 th	1 st	Explain protection of feeder by over current and earth fault relay.
	2 nd	PROTECTION AGAINST OVER VOLTAGE AND LIGHTING Voltage surge and causes of over voltage.
	3 rd	Internal cause of over voltage.
	4 th	Internal cause of over voltage.
	5 th	External cause of over voltage (lighting)
14 th	1 st	Mechanism of lightning discharge
	2 nd	Types of lightning strokes.
	3 rd	Harmful effect of lightning
	4 th	Lightning arresters
	5 th	Type of lightning Arresters. a) Rod-gap lightning arrester. b) Horn-gap arrester
15 th	1 st	c) Valve type arrester. Surge Absorber
	2 nd	STATIC RELAY Advantage of static relay
	3 rd	Instantaneous over current relay.
	4 th	Principle of IDMT relay.
	5 th	Tutorial

Subhrashree Dash
Dt: 04/02/2025