



UTKAL INSTITUTE OF ENGINEERING & TECHNOLOGY

DISCIPLINE: electrical engineering	SEMESTER: 6TH Sem	NAME OF THE TEACHING FACULTY: Engg PRIYADARSHINI PARIDA		
SUBJECT: Th2. SWITCH GEAR AND PROTECTIVE DEVICES	No of Days/Per week class allotted: 5 Class P/W(75)	Semester From Date: 16/01/2024 To Date: 26/04/ 2024 No. Of Weeks: 13		
WEEK	CLASS DAY	THEORY TOPICS <u>PART-A INTRODUCTION TO SWITCHGEAR :</u>	REMARKS	
1st	1st	INTRODUCTION TO SWITCHGEAR	Date	Dean/Principal
	2nd	Switchgear Equipment. And Bus-Bar Arrangement		
	3rd	Switchgear Accommodation		
	4th	Short circuit		
	5th	Short circuit		
2nd	1st	Faults in a power system		
	2nd	<u>PART B (FAULT CALCULATION) :</u> Symmetrical faults on 3-phase system.		
	3rd	Limitation of fault current.		
	4th	Percentage Reactance		
	5th	Percentage Reactance and Base KVA		
3rd	1st	Percentage Reactance and Base KVA		
	2nd	Short – circuit KVA.		
	3rd	Reactor control of short circuit currents.		
	4th	Location of reactors.		
	5th	Steps for symmetrical Fault calculations.		
4th	1st	Solve numerical problems on symmetrical fault.		
	2nd	<u>PART C (FUSES):</u> characteristics of fuse element	Desirable	
	3rd	Fuse Element materials		
	4th	Types of Fuses and important terms used for fuses		

	5 th	Low and High voltage fuses		
5 th	1 st	Current carrying capacity of fuse element.		
	2 nd	Difference Between a Fuse and Circuit Breaker.		
	3 rd	<u>PART D (CIRCUIT BREAKERS):</u> Definition and principle of Circuit Breaker		
	4 th	Definition and principle of Circuit Breaker		
	5 th	Definition and principle of Circuit Breaker		
6 th	1 st	Arc phenomenon and principle of Arc Extinction		
	2 nd	Methods of Arc Extinction		
	3 rd	Definitions of Arc voltage, Re-striking voltage and Recovery voltage.		
	4 th	Classification of circuit Breakers. And Oil circuit Breaker and its classification. And Plain break oil circuit breaker.		
	5 th	Maintenance of oil circuit breaker		
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	Problems of circuit interruption.		
8 th	1 st	Resistance switching.		
	2 nd	Circuit Breaker Rating		
	3 rd	<u>PART E (PROTECTIVE RELAYS):</u> Definition of Protective Relay.		
	4 th	Fundamental requirement of protective relay.		
	5 th	Basic Relay operation		
9 th	1 st	Definition of following important terms Pick-up current Current setting		
	2 nd	Classification of functional relays		
	3 rd	Induction type over current relay (Non-directional)		
	4 th	Induction type directional power relay.		
	5 th	Induction type directional over current relay. And differential relay and types protection		

10 th	1 st	<u>PART F (PROTECTION OF ELECTRICAL POWER EQUIPMENT AND LINES) :</u> Protection of alternator.		
	2 nd	Differential protection of alternators		
	3 rd	Balanced earth fault protection		
	4 th	Protection systems for transformer.		
	5 th	Buchholz relay and Protection of Bus bar and Protection of Transmission line.		
11 th	1 st	Different pilot wire protection (Merz-price voltage Balance system) and Explain protection of feeder by over current and earth fault relay.		
	2 nd	<u>PART G (PROTECTION AGAINST OVER VOLTAGE AND LIGHTING) :</u> Voltage surge and causes of over voltage.		
	3 rd	Internal cause of over voltage		
	4 th	External cause of over voltage (lighting)		
	5 th	Mechanism of lightning discharge.		
12 th	1 st	Types of lightning strokes.		
	2 nd	Harmful effect of lightning.		
	3 rd	Lightning arresters and Type of lightning Arresters		
	4 th	Surge Absorber		
	5 th	<u>PART H (STATIC RELAY) :</u> Advantage of static relay		
13 TH	1 st	Advantage of static relay		
	2 nd	Instantaneous over current relay		
	3 rd	Instantaneous over current relay		
	4 th	Principle of IDMT relay.		
	5 th	Principle of IDMT relay.		
HOD Chittaranjan Perida		DEAN Chittaranjan Perida		PRINCIPAL 