

DISCIPLINE – ELECTRICAL ENGG	SEMESTER 6 <sup>TH</sup>	NAME OF THE TEACHING FACULTY- SIBANI PANDA, LECT(ELECT.)	
SUB-SGPD	No Of Days Per Week Class Alloted-5	SEMESTER FROM 16.01.2024 to 26.04.2024 NO OF WEEK – 15 WEEKS	
WEEK	CLASS DAY	THEORY	STATUS
1 <sup>ST</sup> WEEK	1 <sup>ST</sup> day 2 <sup>nd</sup> day 3 <sup>rd</sup> day 4 <sup>th</sup> day 5 <sup>th</sup> day	<b>INTRODUCTION TO SWITCHGEAR</b> 1.1 Essential Features of switchgear. 1.2 Switchgear Equipment. 1.3 Bus-Bar Arrangement. 1.4 Switchgear Accommodation. 1.5 Short Circuit.	
2 <sup>nd</sup> WEEK	1 <sup>ST</sup> day 2 <sup>nd</sup> day 3 <sup>rd</sup> day 4 <sup>th</sup> day 5 <sup>th</sup> day	1.6 Short circuit. 1.7 Faults in a power system <b>FAULT CALCULATION</b> 2.1 Symmetrical faults on 3-phase system. 2.2 Limitation of fault current. 2.3 Percentage Reactance.	
3 <sup>RD</sup> WEEK	1 <sup>ST</sup> day 2 <sup>nd</sup> day 3 <sup>rd</sup> day 4 <sup>th</sup> day 5 <sup>th</sup> day	2.4 Percentage Reactance and Base KVA. 2.5 Short – circuit KVA. 2.6 Reactor control of short circuit currents.	
4 <sup>TH</sup> WEEK	1 <sup>ST</sup> day 2 <sup>nd</sup> day 3 <sup>rd</sup> day 4 <sup>th</sup> day 5 <sup>th</sup> day	2.7 Location of reactors. 2.8 Steps for symmetrical Fault calculations 2.9 Solve numerical problems on symmetrical fault <b>FUSES</b> 3.1 Desirable characteristics of fuse element. 3.2 Fuse Element materials. .	
5 <sup>TH</sup> WEEK	1 <sup>ST</sup> day 2 <sup>nd</sup> day 3 <sup>rd</sup> day 4 <sup>th</sup> day 5 <sup>th</sup> day	3.3 Types of Fuses and important terms used for fuses. 3.4 Low and High voltage fuses. 3.5 Current carrying capacity of fuse element. 3.6 Difference Between a Fuse and Circuit Breaker	
6 <sup>TH</sup> WEEK	1 <sup>ST</sup> day 2 <sup>nd</sup> day 3 <sup>rd</sup> day	<b>CIRCUIT BREAKERS</b> 4.1 Definition and principle of Circuit Breaker. 4.2 Arc phenomenon and principle of Arc Extinction.	

	4 <sup>th</sup> day 5 <sup>th</sup> day	4.3 Methods of Arc Extinction. 4.4 Definitions of Arc voltage, Re-striking voltage and Recovery voltage. 4.5 Classification of circuit Breakers.
7 <sup>TH</sup> WEEK	1 <sup>ST</sup> day 2 <sup>nd</sup> day 3 <sup>rd</sup> day 4 <sup>th</sup> day 5 <sup>th</sup> day	4.6 Oil circuit Breaker and its classification. 4.7 Plain brake oil circuit breaker. 4.8 Arc control oil circuit breaker. 4.9 Low oil circuit breaker. 4.10 Maintenance of oil circuit breaker. 4.11 Air-Blast circuit breaker and its classification. 4.12 Sulphur Hexa-fluoride (SF6) circuit breaker.
8 <sup>TH</sup> WEEK	1 <sup>ST</sup> day 2 <sup>nd</sup> day 3 <sup>rd</sup> day 4 <sup>th</sup> day 5 <sup>th</sup> day	4.13 Vacuum circuit breakers. 4.14 Switchgear component. 4.15 Problems of circuit interruption. 4.16 Resistance switching. 4.17 Circuit Breaker Rating <b>Internal assessment 1</b>
9 <sup>TH</sup> WEEK	1 <sup>ST</sup> day 2 <sup>nd</sup> day 3 <sup>rd</sup> day 4 <sup>th</sup> day 5 <sup>th</sup> day	<b>PROTECTIVE RELAYS</b> 5.1 Definition of Protective Relay. 5.2 Fundamental requirement of protective relay. 5.3 Basic Relay operation 5.3.1. Electromagnetic Attraction type 5.3.2. Induction type 5.4 Definition of following important terms 5.5 Definition of following important terms. 5.5.1. Pick-up current. 5.5.2. Current setting. 5.5.3. Plug setting Multiplier. 5.5.4. Time setting Multiplier.
10 <sup>TH</sup> WEEK	1 <sup>ST</sup> day 2 <sup>nd</sup> day 3 <sup>rd</sup> day 4 <sup>th</sup> day 5 <sup>th</sup> day	5.6 Classification of functional relays 5.7 Induction type over current relay (Non-directional) 5.8 Induction type directional power relay. 5.9 Induction type directional over current relay 5.10 differential relay 5.10.1 current differential relay 5.10.2 voltage balance differential relay 5.11 types of protection
11 <sup>TH</sup> WEEK	1 <sup>ST</sup> day 2 <sup>nd</sup> day 3 <sup>rd</sup> day 4 <sup>th</sup> day	<b>PROTECTION OF ELECTRICAL POWER EQUIPMENT AND LINES</b> 6.1 Protection of alternator. 6.2 Differential protection of alternators.

	5 <sup>th</sup> day	6.3 Balanced earth fault protection. 6.4 Protection systems for transformer. 6.5 Buchholz relay. 6.6 Protection of Bus bar. 6.7 Protection of Transmission line.	
12 <sup>TH</sup> WEEK	1 <sup>ST</sup> day 2 <sup>nd</sup> day 3 <sup>rd</sup> day 4 <sup>th</sup> day 5 <sup>th</sup> day	6.8 Different pilot wire protection (Merz-price voltage Balance system) 6.9 Explain protection of feeder by over current and earth fault relay <b>PROTECTION AGAINST OVER VOLTAGE AND LIGHTING</b> 7.1. Voltage surge and causes of over voltage. 7.2. Internal cause of over voltage	
13 <sup>TH</sup> WEEK	1 <sup>ST</sup> day 2 <sup>nd</sup> day 3 <sup>rd</sup> day 4 <sup>th</sup> day 5 <sup>th</sup> day	7.3. External cause of over voltage (lighting) 7.4. Mechanism of lightning discharge. 7.5. Types of lightning strokes. 7.6. Harmful effect of lightning.	
14 <sup>TH</sup> WEEK	1 <sup>ST</sup> day 2 <sup>nd</sup> day 3 <sup>rd</sup> day 4 <sup>th</sup> day 5 <sup>th</sup> day	7.7. Lightning arresters and Type of lightning Arresters. 7.7.1. Rod-gap lightning arrester. 7.7.2. Horn-gap arrester. 7.7.3. Valve type arrester. 7.8. Surge Absorber	
15 <sup>TH</sup> WEEK	1 <sup>ST</sup> day 2 <sup>nd</sup> day 3 <sup>rd</sup> day 4 <sup>th</sup> day 5 <sup>th</sup> day	<b>STATIC RELAY:</b> 8. 1 Advantage of static relay. 8. 2 Instantaneous over current relay. 8. 3 Principle of IDMT relay. <b>Internal assessment 2</b>	

*Paul*  
10.01.24