

DISCIPLINE- ELECTRICAL ENGG	SEMESTER- 5 TH	NAME OF THE TEACHING FACULTY- SIBANI PANDA,LECT (ELECT)	
SUB- SWITCHGEAR & PROTECTION	NO OF CLASSES/ WEEK – 3P	TIME PERIOD- 01.07.2026 TO 05.11.2026 NO OF WEEKS- 18	
SL NO	CLASS DAY	TOPIC TO BE COVERED	REMARK
1	1 ST DAY 2 ND DAY 3 RD DAY	Basics of Protection • Necessity, functions of protective system. • Normal and abnormal conditions. • Types of faults and their causes.	
2	1 ST DAY 2 ND DAY 3 RD DAY	• Protection zones and backup protection • Short circuit fault calculations in lines fed by generators through transformers	
3	1 ST DAY 2 ND DAY 3 RD DAY	• Need of current limiting reactors and their arrangements. Circuit Interruption Devices • Isolators- Vertical break, Horizontal break and Pantograph type.	
4	1 ST DAY 2 ND DAY 3 RD DAY	• HRC fuses – Construction, working, characteristics and applications. • Arc formation process, methods of arc extinction (High resistance and Low resistance), Arc voltage, Recovery voltage, Re-striking voltage, RRRV.	
5	1 ST DAY 2 ND DAY 3 RD DAY	• HT circuit breakers (Sulphur-hexa Fluoride (SF₆), Vacuum circuit breaker) - Working, construction, specifications and applications.	
6	1 ST DAY 2 ND DAY 3 RD DAY	• L.T. circuit breaker (Air circuit breakers (ACB), Miniature circuit breakers (MCB), Moulded case circuit breakers (MCCB) and Earth leakage circuit breaker (ELCB)) - Working and applications	
7	1 ST DAY 2 ND DAY 3 RD DAY	• Selection of LT and HT circuit breakers (ratings), Selection of MCCB for motors. • Gas insulated switchgear.	
8	1 ST DAY 2 ND DAY 3 RD DAY	Protective Relays • Fundamental quality requirements: Selectivity, Speed, Sensitivity, Reliability, Simplicity, Economy. • Basic relay terminology- Protective relay, Relay time, Pick up, Reset current, current setting, Plug setting multiplier, Time setting multiplier.	
9	1 ST DAY 2 ND DAY 3 RD DAY	• Protective relays: Classification, principle of working, construction and operation of – Electromagnetic (Attracted armature type, Solenoid type, Watt-hour meter type) relay, • Thermal relay. Block diagram and working of Static relay.	
10	1 ST DAY 2 ND DAY 3 RD DAY	• Overcurrent relay-Time current characteristics. • Microprocessor based over current relays: Block diagram, working. • Distance relaying- Principle, operation of Definite distance relays.	
11	1 ST DAY 2 ND DAY 3 RD DAY	• Directional relay: Need and operation. • Operation of current and voltage differential relay. INTERNAL ASSESSMENT 1	
12	1 ST DAY 2 ND DAY 3 RD DAY	Protection of Alternator and Transformer • Alternator Protection Faults, Differential protection Over current, earth fault, overheating and field failure, protection.	
13	1 ST DAY 2 ND DAY 3 RD DAY	• Reverse power protection. • Transformer Protection Faults, Differential, over current, earth fault	
14	1 ST DAY 2 ND DAY 3 RD DAY	- over heating protection, Limitations of differential protection. • Buchholz relay: Construction, operation, merits and demerits.	
15	1 ST DAY 2 ND DAY 3 RD DAY	Protection of Motors • Bus-bar and Transmission Line Motor Faults. Short circuit protection, Overload protection, Single phase preventer. • Bus bar and Transmission line	
16	1 ST DAY 2 ND DAY 3 RD DAY	• Faults on Bus bar and Transmission Lines. • Bus bar protection: Differential and Fault bus protection.	
17	1 ST DAY 2 ND DAY 3 RD DAY	• Transmission line: Over current, Distance and Pilot wire protection. INTERNAL ASSESSMENT 2	
18	1 ST DAY 2 ND DAY 3 RD DAY	REVISION	

Sibani Panda
26.05.26