

# Government Polytechnic, Balangir

Department of Department of Electrical Engineering

LESSON PLAN 2026-27(WINTER)

NAME OF THE Faculty : Subodh Kanta Barik

Subject: TH:4(a)- SWITCHGEAR AND PROTECTION  
 Program: Diploma in Electrical Engineering  
 Semester: 5th  
 Total Contact Hours: 45  
 Total Marks: 100  
 Assessment: Internal Assessment – 30, End Term – 70

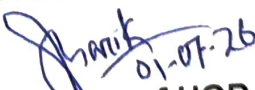
**COURSE OUTCOMES:**

- CO1 Identify faults and protection basics.
- CO2 Select suitable switchgear.
- CO3 Explain protective relays.
- CO4 Explain alternator and transformer protection.
- CO5 Explain protection of motors and transmission lines.

Period	Unit	Topic	Learning Objectives	Activity	Course Outco	Learning Methodology	Homework
1	I	Introduction to Protection System	Explain need and functions of protection	Interactive discussion	CO1	Lecture & PPT	Read introduction
2	I	Normal & Abnormal Conditions	Differentiate normal and abnormal conditions	Discussion	CO1	Lecture	Notes
3	I	Types of Faults	Identify faults in power system	Fault analysis	CO1	Interactive	Assignment
4	I	Protection Zones	Explain protection zones	Diagram	CO1	Lecture	Draw zones
5	I	Short Circuit Calculations	Perform basic fault calculations	Numerical	CO1	Problem solving	Practice
6	I	Current Limiting Reactors	Explain need and arrangements	Lecture	CO1	Lecture	Notes
7	I	Revision	Review Unit I	Quiz	CO1	Discussion	Worksheet
8	II	Isolators	Explain types of isolators	Diagram	CO2	Lecture	Draw types
9	II	HRC Fuses	Explain construction & working	Demo	CO2	Interactive	Assignment
10	II	Arc Formation	Explain arc formation	Video	CO2	ICT	Notes
11	II	Arc Extinction	Explain extinction methods	Discussion	CO2	Lecture	Compare methods
12	II	Recovery Voltage	Explain RRRV	Numerical	CO2	Lecture	Practice
13	II	SF6 Circuit Breaker	Explain SF6 CB	Animation	CO2	Demo	Draw
14	II	Vacuum Circuit Breaker	Explain VCB	Lecture	CO2	Lecture	Notes
15	II	Air Circuit Breaker	Explain ACB	Demo	CO2	Interactive	Assignment
16	II	MCB MCCB ELCB	Compare breakers	Discussion	CO2	Lecture	Comparison
17	II	Selection of Circuit Breakers	Select LT/HT CB	Case study	CO2	Activity	Assignment
18	II	Gas Insulated Switchgear	Explain GIS	PPT	CO2	Lecture	Report
19	II	Revision	Review Unit II	Quiz	CO2	Discussion	Worksheet
20	III	Protective Relay Basics	Explain relay qualities	Lecture	CO3	Lecture	Notes
21	III	Relay Terminology	Explain relay terms	Exercise	CO3	Interactive	Assignment
22	III	Electromagnetic Relays	Explain EM relays	Demo	CO3	Lecture	Draw

	III	Thermal & Static Relays	Explain thermal/static relays	Video	CO3	ICT	Notes
24	III	Overcurrent Relay	Explain characteristics	Graph	CO3	Lecture	Practice
25	III	Microprocessor Relay	Explain operation	Seminar	CO3	Interactive	Assignment
26	III	Distance Relay	Explain distance relay	Diagram	CO3	Lecture	Notes
27	III	Directional Relay	Explain directional relay	Discussion	CO3	Lecture	Assignment
28	III	Differential Relay	Explain differential relay	Demo	CO3	Interactive	Worksheet
29	III	Revision	Review Unit III	Quiz	CO3	Discussion	Practice
30	IV	Alternator Protection	Explain alternator protection	Lecture	CO4	Lecture	Notes
31	IV	Reverse Power Protection	Explain reverse power	Discussion	CO4	Interactive	Assignment
32	IV	Transformer Protection	Explain transformer faults	Diagram	CO4	Lecture	Notes
33	IV	Differential Protection	Explain differential protection	Demo	CO4	Lecture	Draw
34	IV	Earth Fault Protection	Explain earth fault	Case study	CO4	Interactive	Assignment
35	IV	Buchholz Relay	Explain Buchholz relay	Video	CO4	ICT	Notes
36	IV	Limitations	Explain limitations	Discussion	CO4	Lecture	Assignment
37	IV	Revision	Review Unit IV	Quiz	CO4	Discussion	Worksheet
38	V	Motor Protection	Explain motor protection	Lecture	CO5	Lecture	Notes
39	V	Single Phase Preventer	Explain operation	Demo	CO5	Interactive	Assignment
40	V	Bus Bar Protection	Explain bus bar protection	Diagram	CO5	Lecture	Draw
41	V	Transmission Line Faults	Explain faults	Discussion	CO5	Lecture	Notes
42	V	Transmission Line Protection	Explain line protection	Lecture	CO5	PPT	Assignment
43	V	Revision	Review Unit V	Quiz	CO5	Discussion	Revise
44	All	Numerical Practice	Solve problems	Practice	CO1-CO5	Problem solving	Revise
45	All	Class Test	Assess outcomes	Test	CO1-CO5	Assessment	Prepare exam

  
01-07-26  
Signature of Faculty

  
01-07-26  
Signature of HOD