

# Government Polytechnic, Balangir

Department of Department of Electrical Engineering

LESSON PLAN 2026-27(WINTER)

NAME OF THE Faculty : Guest Faculty-1

Subject: TH:1- INTRODUCTION TO ELECTRIC GENERATION SYSTEMS

Program: Diploma in Electrical Engineering

Semester: 3rd

Total Contact Hours: 45

Total Marks: 100

Assessment: Internal Assessment – 30, End Term – 70

**COURSE OUTCOMES:**

CO1 Explain the optimized working of thermal power plants.

CO2 Describe the efficient operation of large hydropower plants.

CO3 Describe the efficient operation of micro hydropower plants.

CO4 Select adequate mix of power generation based on economic operation.

Period	Unit	Topic	Learning Objectives	Activity	Course Outcome	Learning Methodology	Homework
1	I	Introduction to Electric Generation Systems	Explain different methods of electricity generation	Interactive discussion	CO1	Lecture & PPT	Read introduction
2	I	Layout of Thermal Power Plant	Describe major sections of a thermal power plant	Layout explanation	CO1	Lecture + PPT	Draw plant layout
3	I	Working of Thermal Power Plant	Explain steam power generation process	Video demonstration	CO1	ICT based learning	Prepare flow chart
4	I	Steam Turbine & Generator	Explain turbine-generator operation	Diagram discussion	CO1	Lecture	Notes
5	I	Conventional Fuels	Identify coal, gas, diesel and nuclear fuels	Group discussion	CO1	Interactive lecture	Compare fuels
6	I	Coal Properties	Explain properties of coal	Sample observation	CO1	Lecture	Assignment
7	I	Gas & Diesel Properties	Describe gaseous and liquid fuels	Discussion	CO1	Lecture	Short notes
8	I	Nuclear Fuel	Explain fission and fusion	Animation	CO1	ICT	Assignment
9	I	Coal-based Thermal Plant	Explain construction and working	Video	CO1	Demonstration	Draw block diagram
10	I	Gas-based Thermal Plant	Explain gas turbine plant	Lecture	CO1	Interactive	Notes
11	I	Diesel Power Plant	Explain diesel engine plant	Demonstration	CO1	Lecture	Assignment
12	I	Nuclear Power Plant	Explain nuclear power generation	Video presentation	CO1	ICT	Prepare report
13	I	Boilers	Explain fire tube and water tube boilers	Diagram explanation	CO1	Lecture	Compare boilers
14	I	Combustion Engines	Explain gas and diesel engines	Demonstration	CO1	Interactive	Assignment
15	I	Nuclear Reactors & Shielding	Explain reactor types and waste disposal	Discussion	CO1	Lecture	Short notes
16	I	Unit-I Revision	Review thermal power generation	Quiz	CO1	Discussion	Unit-I worksheet
17	II	Introduction to Hydropower	Explain hydroelectric energy conversion	Lecture	CO2	PPT	Read chapter
18	II	Energy Conversion Process	Explain conversion of hydraulic energy	Diagram explanation	CO2	Lecture	Assignment
19	II	Classification of Hydropower Plants	Classify high, medium & low head plants	Discussion	CO2	Interactive	Prepare comparison
20	II	Pelton Turbine	Explain construction and working	Video	CO2	ICT	Draw diagram
21	II	Francis Turbine	Explain construction and working	Lecture	CO2	Interactive	Notes

22	II	Kaplan Turbine	Explain construction and working	Demonstration	CO2	Lecture	Assignment
23	II	Safety Practices	Explain safety in hydro plants	Case study	CO2	Activity-based	Prepare safety list
24	II	Hydropower Plants in India	Identify major hydro stations	Map activity	CO2	Interactive	Locate on map
25	II	Unit-II Revision	Revise hydropower concepts	Quiz	CO2	Discussion	Practice questions
26	III	Introduction to Micro Hydropower	Explain micro hydro systems	Lecture	CO3	PPT	Notes
27	III	Layout of Micro Hydro Plant	Explain layout	Diagram discussion	CO3	Lecture	Draw layout
28	III	Pelton Turbine (Micro Hydro)	Explain application	Demonstration	CO3	Interactive	Assignment
29	III	Francis Turbine (Micro Hydro)	Explain application	Lecture	CO3	Discussion	Notes
30	III	Kaplan Turbine (Micro Hydro)	Explain application	Video	CO3	ICT	Assignment
31	III	Locations in India	Identify micro hydro projects	Map activity	CO3	Activity	Prepare report
32	III	Advantages & Limitations	Discuss merits and demerits	Group discussion	CO3	Collaborative learning	Assignment
33	III	Unit-III Revision	Review complete unit	Quiz	CO3	Discussion	Practice questions
34	IV	Connected Load & Firm Power	Define power system terms	Lecture	CO4	PPT	Notes
35	IV	Reserve & Load Concepts	Explain reserve and load curves	Graph plotting	CO4	Lecture	Draw curves
36	IV	Load Duration Curve	Interpret load duration curve	Numerical discussion	CO4	Interactive	Assignment
37	IV	Cost of Generation	Explain cost factors	Problem solving	CO4	Lecture	Numerical practice
38	IV	Demand & Capacity Factors	Calculate performance factors	Numerical examples	CO4	Problem solving	Solve problems
39	IV	Diversity & Load Factors	Explain system factors	Board work	CO4	Lecture	Assignment
40	IV	Generator Unit Selection	Explain unit sizing	Case study	CO4	Discussion	Prepare notes
41	IV	Combined Operation of Power Stations	Explain interconnected operation	Lecture	CO4	Interactive	Assignment
42	IV	Grid System	Explain state and national grids	PPT	CO4	Lecture	Notes
43	IV	Brownout & Blackout	Explain causes and impacts	Case discussion	CO4	Activity-based	Report writing
44	IV	Unit-IV Revision	Comprehensive revision	Question-answer session	CO4	Discussion	Final revision
45	All	Class Test & Feedback	Evaluate learning outcomes	Written test & discussion	CO1-CO4	Assessment	Prepare for end-semester

Signature of Faculty

*Pratik*  
01-07-20  
Signature of HOD