

DEPARTMENT OF ELECTRICAL ENGINEERING
GOVERNMENT POLYTECHNIC, BARGARH



LESSON PLAN

RENEWABLE ENERGY POWER PLANTS (TH-5)

3RD SEMESTER

ELECTRICAL ENGINEERING DEPARTMENT

PREPARED BY

NITESH KUMAR ACHARYA

LECTURER(S-II) (ELECTRICAL ENGG)

DEPARTMENT OF ELECTRICAL ENGINEERING

VISION:

To produce Electrical Engineer professionals who can contribute for socio-economic and technological development to meet global needs.

MISSION:

M1 - To strengthen academic infrastructure leading to quality professional by using modern technical tools and technologies.

M2 - To impart innovative knowledge among the students and make more industry-institution programs to make them successful professionals for serving the society.

M3 - To provide a learning environment to improve problem solving abilities, leadership abilities, ethical responsibilities and lifelong learning.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

PEO1: Apply electrical engineering knowledge and practical skills to solve well-defined engineering problems using modern tools and techniques.

PEO2: Perform effectively in industry and society as competent junior engineer, supervisors, or entrepreneurs with ethical and sustainable engineering practices.

PEO3: Demonstrate teamwork, communication, leadership, and project management skills in professional engineering activities.

PEO4: Engage in lifelong learning and adapt to emerging technologies for career growth and higher education.

PROGRAM SPECIFIC OUTCOMES

The electrical diploma engineers will be able to:

PSO1:-Apply the fundamentals of mathematics, science and engineering knowledge to identify, formulate, design and investigate engineering problems of electric circuits, analog and digital electronics, control system, electrical machines and power system.

PSO2:- Apply the appropriate techniques and modern engineering hardware and software tools in electrical engineering to engage in life-long learning and to successfully adapt in multidisciplinary environments.

PSO3:-Work professionally in power systems engineering, Electrical machinery and electrical circuit.

GOVERNMENT POLYTECHNIC, BARGARH

Department Of Electrical Engineering

Semester: 3RD, DIPLOMA

Subject: RENEWABLE ENERGY POWER PLANT

Branch: Electrical Engineering

Session: -WINTER-2025(14.07.2025 to 15.11.2025)

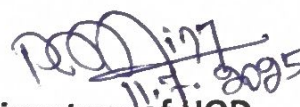
No of Period :- 45 (3p/week)

Name of Faculty: NITESH KU. ACHARYA

Week	Period	Topics to be covered
1 st Week	1	Solar PV and Concentrated Solar Power Plants:- Solar Map of India
	2	Global solar power radiation
	3	Solar PV system
2 nd Week	4	Concentrated Solar Power (CSP) plants
	5	construction and working of: Power Tower
	6	construction and working of: Parabolic Trough
3 rd Week	7	construction and working of: Parabolic Dish
	8	construction and working of: Fresnel Reflectors
	9	Solar Photovoltaic (PV) power plant: components layout, construction
4 th Week	10	Solar Photovoltaic (PV) power plant:-working
	11	Roof top solar PV power system
	12	Large Wind Power Plants- Wind Map of India
5 th Week	13	Wind power density
	14	Lift and drag principle; long path theory
	15	Geared type wind power plants: components, layout and working
6 th Week	16	Direct drive type wind power plants: components, layout and working
	17	Constant Speed Electric Generators: Squirrel Cage Induction Generators(SCIG)
	18	Wound Rotor Induction Generator (WRIG)
7 th Week	19	Variable Speed Electric Generators: Doubly-fed induction generator (DFIG)
	20	wound rotor synchronous generator (WRSG)
	21	permanent magnet synchronous generator (PMSG)
8 th Week	22	Small Wind Turbines-Horizon axis small wind turbine: direct drive type, components
	23	Horizon axis small wind turbine: direct drive type ,working
	24	Horizontal axis small wind turbine: geared type, components and working
9 th Week	25	Vertical axis small wind turbine: direct drive, components and working
	26	Vertical axis small wind turbine: geared type, components and working
	27	Types of towers used in small wind turbines

10 th Week	28	Installation of small wind turbines on rooftops and open fields.
	29	Electric generators used in small wind power plants
	30	Biomass-based Power Plants- Properties of solid fuel for biomass power plants
11 th Week	31	bagasse, wood chips, rice husk, municipal waste
	32	Properties of liquid and gaseous fuel for bio mass power plants: Jatropha, biodiesel gobar gas
	33	Properties of liquid and gaseous fuel for bio mass power plants: Jatropha, biodiesel gobar gas
12 th Week	34	Layout of a Bio-chemical based (e.g. biogas) power plan
	35	Working of a Bio-chemical based (e.g. biogas) power plan
	36	Layout of a Thermo-chemical based (e.g. Municipal waste) power plant
13 th Week	37	Working of a Thermo-chemical based (e.g. Municipal waste) power plant
	38	Layout of a Agro-chemical based (e.g.bio-diesel) power plant
	39	Working of a Agro-chemical based (e.g.bio-diesel) power plant
14 th Week	40	Revision and model question discussion
	41	Revision and model question discussion
	42	Revision and model question discussion
15 th week	43	Revision and model question discussion
	44	Revision and model question discussion
	45	Revision and model question discussion


Signature of Faculty


Signature of HOD