

LESSON PLAN

SUB:-RENEWABLE ENERGY SYSTEMS.

BRANCH:- ELECTRICAL ENGG.

SEMESTER: 6TH

NAME OF FACULTY: - SUSHANTA KUMAR NAYAK



GOVERNMENT POLYTECHNIC,
BHADRAK

SESSION:2023-24

[Signature]
HOD Electrical
13-05-24

HOD (ELECT.)
G.P.BHADRAK

[Signature]
13.1.24
Academic Co-ordinator

Academic Co-ordinator

[Signature]
13-05-24
Principal
Govt. Polytechnic Bhadrak
Principal
Govt. Polytechnic
Bhadrak

| Discipline: ELECTRICAL ENGG. | Semester: 6th | Name of the Teaching Faculty : SUSHANTA KUMAR NAYAK(LECT.IN ELECT.ENGG.) |
|--|--|--|
| Subject: RENEWABLE ENERGY SYSTEMS | No. of Days/per week class allotted:60/4 | Semester from date: 16.01.2024 To Date: 26.04.2024 No. of Weeks:15 |
| Week | Class Day | Theory |
| 1 st | 1 st | Introduction to Renewable energy: Environmental consequences of fossil fuel use |
| | 2 nd | Importance of renewable sources of energy. |
| | 3 rd | Sustainable Design and development. |
| | 4 th | Types of RE sources. And Limitations of RE sources |
| 2 nd | 1 st | Present Indian and international energy scenario of conventional and RE sources |
| | 2 nd | Solar Energy: . Solar photovoltaic system-Operating principle. |
| | 3 rd | Photovoltaic cell concepts |
| | 4 th | Cell, module, array, Series and parallel connections. |
| 3 rd | 1 st | Maximum power point tracking (MPPT) |
| | 2 nd | Classification of energy Sources. |
| | 3 rd | Extra-terrestrial and terrestrial Radiation. |
| | 4 th | Azimuth angle, Zenith angle, Hour angle, |
| 4 th | 1 st | Irradiance, Solar constant. |
| | 2 nd | Solar collectors, |
| | 3 rd | Types and performance characteristics, |
| | 4 th | Applications: Photovoltaic - battery charger, |
| 5 th | 1 st | domestic lighting, street lighting |
| | 2 nd | water pumping |
| | 3 rd | solar cooker, |
| | 4 th | , Solar Pond. |
| 6 th | 1 st | Wind Energy: Introduction to Wind energy |
| | 2 nd | Wind energy conversion |
| | 3 rd | Types of wind turbines |
| | 4 th | Aerodynamics of wind rotors. |
| 7 th | 1 st | Wind turbine control systems; conversion to electrical power: |
| | 2 nd | Induction and synchronous generators. |
| | 3 rd | Grid connected and self excited induction generator operation. |
| | 4 th | Constant voltage generation with power electronic control. |
| 8 th | 1 st | Constant frequency generation with power electronic control. |
| | 2 nd | Single output systems. |
| | 3 rd | Double output systems. |
| | 4 th | Characteristics of wind power plant. |
| 9 th | 1 st | Biomass Power: |

| | | |
|------------------|-----------------|---|
| | | Energy from Biomass |
| | 2 nd | Biomass as Renewable Energy Source |
| | 3 rd | Types of Biomass Fuels - Solid, |
| | 4 th | Types of Biomass Fuels - Liquid |
| 10 th | 1 st | Types of Biomass Fuels - Gas |
| | 2 nd | Combustion and fermentation. |
| | 3 rd | Anaerobic digestion. |
| | 4 th | Types of biogas digester |
| 11 th | 1 st | Wood gassifier |
| | 2 nd | Pyrolysis, |
| | 3 rd | Applications: Bio gas |
| | 4 th | Applications: Bio diesel |
| 12 th | 1 st | Other Energy Sources |
| | | Tidal Energy: |
| | 2 nd | Energy from the tides, |
| | 3 rd | Barrage Tidal power systems. |
| | 4 th | Non Barrage Tidal power systems. |
| 13 th | 1 st | Ocean Thermal Energy Conversion (OTEC) |
| | 2 nd | Ocean Thermal Energy Conversion (OTEC). |
| | 3 rd | Geothermal Energy - Classification |
| | 4 th | Geothermal Energy - Classification |
| 14 th | 1 st | Hybrid Energy Systems |
| | 2 nd | Need for Hybrid Systems. |
| | 3 rd | Diesel-PV, |
| | 4 th | Wind-PV, |
| 15 th | 1 st | Microhydel-PV. |
| | 2 nd | Electric vehicles. |
| | 3 rd | Hybrid electric vehicles. |
| | 4 th | Hybrid electric vehicles. |

2024
SIGNATURE OF THE FACULTY

Lect. in Elect. Engg.
Govt. Poly. Bhadrak