



GANDHI SCHOOL OF ENGINEERING

BHABANDHA, BERHAMPUR

BRANCH:- ELECTRICAL ENGINEERING

SEMESTER:- 6TH

SUBJECT:- RENEWABLE ENERGY

Name of the Faculty- Er. DEBASHRI PATTNAIK & Er. MONOJ NAYAK

| Sl. No | Topic/Module | No. of period | Details of the topics | Date | Topic No. | Topic Name | Date | Remarks |
|--------|--|---------------|--|--------------------------------|--|--|--|---------|
| 1 | Introduction to Renewable energy: | 05 | 1.1. Environmental consequences of fossil fuel use. 1.2. Importance of renewable sources of energy. 1.3. Sustainable Design and development. 1.4. Types of RE sources. 1.5. Limitations of RE sources. 1.6. Present Indian and international energy scenario of conventional and RE sources | 13.02.2023 To 17.02.2023 | 1.1 1.2 1.3 1.4 1.5 1.6 | Environmental consequences of fossil fuel use. Importance of renewable sources of energy. Sustainable Design and development. Types of RE sources. Limitations of RE sources. Present Indian and international energy scenario of conventional and RE sources | 13.02.2023 14.02.2023 15.02.2023 16.02.2023 17.02.2023 | |

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| 2 | Solar Energy | 15 | <p>2.1. Solar photovoltaic system-Operating principle</p> <p>2.2. Photovoltaic cell concepts</p> <p>2.2.1. Cell, module, array, Series and parallel connections. Maximum power point tracking (MPPT).</p> <p>2.3. Classification of energy Sources.</p> <p>2.4. Extra-terrestrial and terrestrial Radiation.</p> <p>2.5. Azimuth angle, Zenith angle, Hour angle, Irradiance, Solar constant.</p> <p>2.6. Solar collectors, Types and performance characteristics,</p> <p>2.7. Applications: Photovoltaic - battery charger, domestic lighting, street lighting, water pumping, solar cooker, Solar Pond.</p> | <p>20.02.2023</p> <p>To</p> <p>02.03.2023</p> | <p>2.1 Solar photovoltaic system-Operating principal</p> <p>2.2 Photovoltaic cell concepts</p> <p>2.2.1 Cell, module, array, Series and parallel connections.</p> <p>2.3 Maximum power point tracking (MPPT).</p> <p>2.4 Classification of energy Sources.</p> <p>2.5 Extra-terrestrial and terrestrial Radiation.</p> <p>2.6 Azimuth angle, Zenith angle, Hour angle, Irradiance, Solar constant.</p> <p>2.7 Solar collectors, Types and performance characteristics, Applications: Photovoltaic - battery charger, domestic lighting, street lighting, water pumping, solar cooker, Solar Pond.</p> | <p>20.02.2023</p> <p>21.02.2023</p> <p>22.02.2023</p> <p>22.02.2023</p> <p>23.02.2023</p> <p>23.02.2023</p> <p>23.02.2023</p> <p>27.02.2023</p> <p>27.02.2023</p> <p>28.02.2023</p> <p>28.02.2023</p> <p>28.02.2023</p> <p>01.03.2023</p> <p>01.03.2023</p> <p>02.03.2023</p> | |
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| 03 | Wind Energy: | 12 | <p>3.1. Introduction to Wind energy.</p> <p>3.2. Wind energy conversion.</p> <p>3.3. Types of wind turbines</p> <p>3.4. Aerodynamics of wind rotors.</p> <p>3.5. Wind turbine control systems; conversion to electrical power:</p> <p>3.6. Induction and synchronous generators.</p> <p>3.7. Grid connected and self excited induction generator operation.</p> <p>3.8. Constant voltage and constant frequency generation with power electronic control.</p> <p>3.9. Single and double output systems.</p> <p>3.10. Characteristics of wind power plant.</p> | 09.03.2023 To 27.03.2023 | <p>3.1</p> <p>3.2</p> <p>3.3</p> <p>3.4</p> <p>3.5</p> <p>3.6</p> <p>3.7</p> <p>3.8</p> <p>3.9</p> <p>3.10</p> | <p>3.1. Introduction to Wind energy.</p> <p>3.2. Wind energy conversion.</p> <p>3.3. Types of wind turbines</p> <p>3.4. Aerodynamics of wind rotors.</p> <p>3.5. Wind turbine control systems; conversion to electrical power:</p> <p>3.6. Induction and synchronous generators.</p> <p>3.7. Grid connected and self excited induction generator operation.</p> <p>3.8. Constant voltage and constant frequency generation with power electronic control.</p> <p>3.9. Single and double output systems.</p> <p>3.10. Characteristics of wind power plant.</p> | <p>09.03.2023</p> <p>10.03.2023</p> <p>13.03.2023</p> <p>14.03.2023</p> <p>15.03.2023</p> <p>16.03.2023</p> <p>17.03.2023</p> <p>20.03.2023</p> <p>21.03.2023</p> <p>22.03.2023</p> <p>24.03.2023</p> <p>27.03.2023</p> | |
| 04 | BIOMASS ENERGY: | 12 | <p>4.1. Energy from Biomass.</p> <p>4.2. Biomass as Renewable Energy Source</p> <p>4.3. Types of Biomass Fuels - Solid, Liquid and Gas.</p> <p>4.4. Combustion and fermentation.</p> <p>4.5. Anaerobic digestion.</p> <p>4.6. Types of biogas digester.</p> <p>4.7. Wood gassifier.</p> <p>4.8. Pyrolysis,.</p> <p>4.9. Applications: Bio gas, Bio diesel</p> | 28.03.2023 To 17.04.2023 | <p>4.1</p> <p>4.2</p> <p>4.3</p> <p>4.4</p> <p>4.5</p> <p>4.6</p> <p>4.7</p> <p>4.8</p> <p>4.9</p> | <p>4.1. Energy from Biomass.</p> <p>4.2. Biomass as Renewable Energy Source</p> <p>4.3. Types of Biomass Fuels - Solid, Liquid and Gas.</p> <p>4.4. Combustion and fermentation.</p> <p>4.5. Anaerobic digestion.</p> <p>4.6. Types of biogas digester.</p> <p>4.7. Wood gassifier.</p> | <p>28.03.2023</p> <p>03.04.2023</p> <p>04.04.2023</p> <p>05.04.2023</p> <p>06.04.2023</p> <p>10.04.2023</p> <p>11.04.2023</p> <p>12.04.2023</p> <p>13.04.2023</p> <p>17.04.2023</p> <p>18.04.2023</p> <p>19.04.2023</p> <p>20.04.2023</p> <p>24.04.2023</p> | |

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| | | | | | | 4.8. Pyrolysis, 4.9. Applications: Bio gas, Bio diesel | | |
| 05 | OTHER ENERGY RESOURCES: | 16 | Other Energy Sources 5.1. Tidal Energy: Energy from the tides, Barrage and Non Barrage Tidal power systems. 5.2. Ocean Thermal Energy Conversion (OTEC). 5.3. Geothermal Energy – Classification. 5.4. Hybrid Energy Systems. 5.5. Need for Hybrid Systems. 5.6. Diesel-PV, Wind-PV, Microhydel-PV. 5.7. Electric and hybrid electric vehicles | | 5.1 5.2 5.3 5.4 5.5 5.6 5.7 | Other Energy Sources 5.1. Tidal Energy: Energy from the tides, Barrage and Non Barrage Tidal power systems. 5.2. Ocean Thermal Energy Conversion (OTEC). 5.3. Geothermal Energy – Classification. 5.4. Hybrid Energy Systems. 5.5. Need for Hybrid Systems. 5.6. Diesel- PV, Wind-PV, Microhydel-PV. 5.7. Electric and hybrid electric vehicles | 25.04.2023 28.04.2023 29.04.2023 01.05.2023 02.05.2023 05.05.2023 06.05.2023 08.05.2023 09.05.2023 12.05.2023 13.05.2023 15.05.2023 16.05.2023 18.05.2023 22.05.2023 23.05.2023 23.05.2023 | |


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