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| **GBN Govt. Polytechnic Nilokheri, Karnal** |
| **Electrical Engineering Department**

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| **Name of Faculty** | Mitesh Kumar  |
| **Discipline** | Electrical Engineering |
| **Semester** | 2nd (Even- semester) |
| **Subject** | Non- Conventional Energy Sources |
| **Lesson Plan Duration** | From March 2023 to June 2023 |
| **Work load (Theory + Practical ) Per Week** | (02+02) |

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| **Week** | **Day** | **Topics** | **Day** | **Practical** |
| 1 | Day 1 | Discussion of Course Objective of NCES subject/ Syllabus, **Unit :1** Introduction to Basics of Energy | Day 1 | 1. Familiarization with the different components used in solar PV plant (standalone and grid connected system), solar water heating system, solar cooker, solar lighting etc.
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| Day 2 | Classification of Energy-primary and secondary energy, commercial and non-commercial energy |
| 2 | Day 1 | Importance of non-conventional energy sources, Present scenario, Future Prospectus | Day 2  | 1. Calculate power flow of a stand-alone PV system with DC load, AC load and battery.

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| Day 2 | Energy Scenario in India, Sector-wise energy consumption (domestic, industrial, agriculture etc) |
| 3 | Day 1 | **Unit : 2** Introduction to Solar Energy, Principle of conversion of solar radiation into heat, photo-voltaic cell | Day 3  | 1. To demonstrate "I-V Characteristics and Efficiency of 1kWp Solar PV System” with varying radiation and temperature level.

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| Day 2 | Electricity generation, Application of Solar Energy like solar water heaters |
| 4 | Day 1 | Solar Furnaces, Solar Cookers | Day 4 | 1. Assemble the components of solar home lighting system & study the system.
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| Day 2 | Solar lighting, Solar pumping |
| 5 | Day 1 | Unit: 3 Bio- energy, Bio-mass conversion technologies-wet and dry processes |  |  |
| Day 2 | Revision and problem related to 2nd Unit/ discussion related to topic |   |   |
| 6 | Day 1 | Unit: 3 Methods for obtaining energy from biomass | Day 5 | 1. Assemble the components of solar water heating system & study the system.

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| Day 2 | Power generation by using gasifies |   |
| 7 | Day 1 | Unit : 4 Introduction to Wind energy, Wind Energy Conversion |   |   |
| Day 2 | Windmills, Electricity generation from wind- Types of wind mills |   |   |
| 8 | Day 1 | Unit: 4 Local Control | Day 6  | 1. Identify Troubleshoot solar PV panel, inverter and solar smart metering system.

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| Day 2 | Energy storage |
| 9 | Day 1 | Unit: 5 Introduction to Geo-thermal and Tidal Energy, Geo-thermal sources | Day 7  | 1. Identify the specified components of a 1 KW Small Wind Turbine (SWT) system and study them.
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| Day 2 | Ocean thermal electric conversion, Open and Closed cycles |   |
| 10 | Day 1 | Unit : 5 Hybrid cycles, Prime movers for geo-thermal energy conversion | Day 8  | 1. Estimation of wind speed using anemometer.

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| Day 2 | Steam Generation and electricity generation |
| 11 | Day 1 | Unit :- 6 Introduction to MHD | Day 9  | 1. Study of charging and discharging behavior of a capacitor.

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| Day 2 | Magneto hydro Dynamic (MHD) |
| 12 | Day 1 | Unit : 7 Fuel Cells, Design and operating Principles of a fuel cell | Day 10  | 1. Visit nearby renewable power plant and write specification of each components used in that plant.
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| Day 2 | Conversion Efficiency |   |
| 13 | Day 1 | Display of 2nd sessional marks and identification of weak students. | Day 11  | 1. Study of charging characteristics of a Ni-Cd battery using solar photovoltaic panel.
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| Day 2 | Unit : 7 Work output and emf of fuel cells, Applications |   |
| 14 | Day 1 | Unit : 8 Hydro Energy | Day 12  | Study the Performance of fuel cell.  |
| 2 | Mini & micro hydro plants |
| 15 | Day 1 | Revision and problem related to 8th unit |   |    |
| Day 2 | Discussion of old question paper of HSBTE. |   |   |