

**UNIT I****Chapter 1 : Solar Thermal Systems 1-1 to 1-34****Syllabus :**

- 1.1 Alternative energy sources : Primary, secondary and tertiary energy
- 1.2 Classification of solar thermal systems
- 1.3 Concentrated Solar Power (CSP) Systems : Flat plate collectors, parabolic collectors, parabolic dish collector, solar tower.
- 1.4 Domestic : Water heating systems. Commercial heating systems used for process heating installation-standard procedure, precautions, plumbing-piping, valves.
- 1.5 Maintenance : Routine maintenance procedure for domestic and commercial water heater systems. Failure maintenance-major causes, remedies.
- 1.6 Solar dryers : Classification, construction, working and applications-commercial, agro-products, domestic.
- 1.7 Choice of a system for a given applications-technical and financial criteria used for selection

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- 5.2 Biomass power plants, biogas plants, gasifiers, digestors, bio diesel plants : Layout, construction and principle of working and specification for small power plant of all these.
- 5.3 Installation and maintenance procedure of Bio gas plant.
- 5.4 Applications of various bio fuels Domestic heating, cooking, Commercial-process heating, power generation
- 5.5 Systems used for utilization of bio fuels-smokeless chullhas, burners, heaters and engines.

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UNIT VI

Chapter 6 Renewable Energy Hybrid Systems and Feasible Studies 6-1 to 6-18

Syllabus

- 6.1 Types of Hybrid system : Wind-solar, wind-biogas, Solar-Biogas : Specification, construction and specification of all these.
- 6.2 Power output of hybrid system.
- 6.3 Installation-procedure, precautions, Operating procedures of Wind-Solar PV hybrid system.
- 6.4 Choice of systems : technical and commercial feasibility assessment, costing of renewable energy systems.

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