

UNIT I**Chapter 1 : Solar Energy Principles****1-1 to 1-45**

Syllabus : Present solar energy scenario, world energy futures, governing bodies (self-study), solar radiations and its measurements, solar constant, solar radiation geometry, solar radiation data, estimation of average solar radiation, solar radiation on tilted surface.

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UNIT II
Chapter 2 : Solar Thermal Systems and Applications**2-1 to 2-44**

Syllabus : Types of solar thermal collector, flat plate collector analysis, evacuated tube collectors (ETC) analysis, its design and application, solar air heaters and its types, solar distillation.

Solar concentrating collectors : Types - line and point concentrator, theory of concentrating collectors, parabolic trough collector, parabolic dish collector, solar tower, concentrated Fresnel linear receiver (CFLR).

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UNIT III

Chapter 3 : Solar Photovoltaic and Applications
3-1 to 3-37

Syllabus : Forming the PN junction solar cells and its applications, structure of a solar cell, types of modules, PV array, solar cell equation, Fill factor and maximum power, Grid aspects of solar power, equipment used in solar photovoltaic plants, power conditioning Equipment-inverters, regulators, other Devices; System Analysis Design procedure, Design constraints, other considerations.

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UNIT IV**Chapter 4 : Case Study on Solar Energy Applications**

4-1 to 4-48

Syllabus :**Case study 1 :** Design of solar food drier for domestic purpose referring existing system**Case study 2 :** Design of parabolic dish solar cooker for domestic purpose referring existing system**Case study 3 :** Design of solar photovoltaic system for domestic purpose referring existing system

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UNIT V**Chapter 5 : Wind Energy**

5-1 to 5-41

Syllabus : Principle of wind energy conversion; Basic components of wind energy conversion systems; various types and their constructional features; design considerations of horizontal and vertical axis wind machines : analysis of aerodynamic forces acting on wind mill blades and estimation of power output; wind data and site selection considerations, wind energy potential and installation in India.

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UNIT VI**Chapter 6 : Case Study on Windmill Design**

6-1 to 6-33

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