Approval: 10th Senate Meeting

Course Number: ME 638

Course Name: Solar Thermal Power Plant

Credits: 3-0-0-3

Prerequisites: Instructor's consent

Intended for: M. Tech. /UG/MS/PhD

Distribution: Specialized stream elective course for M. Tech. in Mechanical Engineering with specialization in Energy Systems, and elective course for other students

Semester: Odd/Even

Preamble: This course will contribute to a comprehensive understanding of solar thermal power technology with an objective to direct utilisation of solar heat energy for heating and power production applications.

Course Outline: This course will cover the construction details, inter-connection, functionality parameter appreciation and selection of parameters according to scales for various components of solar thermal power plants.

Course Modules:

Module - 1:
Physical processes that determine the output of a solar thermal collector, and mathematical models that can be used to calculate this output, relation between factors and models, materials and surface treatments for use in a solar collector, optical parameters of absorbers, reflectors and transparent materials and comparison of their characteristics (6 **L**)

Module - 2:

Evaluate of different thermal loads and its mathematical modeling, design of different solar thermal systems and comparing their suitability for different boundary conditions (8 **L**)

Module - 3:

Calculation of storage capacity for different heat storage techniques and determine their

suitability for given boundary conditions (7 **L**)

Module - 4:
Function of the important components necessary in a solar thermal system and the testing

standards used for their evaluation (7 **L**)

Module - 5:
Need and challenges involved in using solar energy for cooking, cooling, distillation and drying applications as well as identify niche areas for these applications, functioning of different designs and system dimensions of solar cookers, stoves, cooling systems and dryers (14 **L**)

Text Books:

1. Peter Gevorkian. Large-Scale Solar Power System Design: An Engineering Guide for Grid Connected Solar Power Generation. McGraw-Hill: New York (2011).

Other Faculty interested in teaching this course: Dr. Pradeep Kumar

Proposed by: Dr. Satvasheel Powar/ Dr. Rajeev Kumar School: SE

Signature_____Date_____

Recommended/Not Recommended, with Comments:

_____ Date:_____

Chairman, CPC

Approved / Not Approved

_____ Date:_____

Chairman, Senate