Approval 10th Senate meeting

S6. Course Number: ME 640

Course Name: Solar Power Utilization

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 discuss about various end use application areas for solar energy for devising an economical and sustainable solar energy utilization planning strategy.

Course Outline: This course covers typical cost-effective applications including water pumping, residential electrification, lighting, small-scale irrigation, refrigeration, and electric fences which will includes examples, case studies, and lessons learned that show how to implement solar energy projects.

Course Modules:

Module – 1:
Solar radiation and modeling, solar collectors and types: flat plate, concentrating solar collectors, advanced collectors and solar concentrators, Selective coatings (14 L)

Module – 2:
Solar water heating, Solar cooking, Solar drying, Solar distillation and solar refrigeration, Active and passive heating and cooling of buildings (14 L)

Module – 3:
Solar thermal power generation, Solar cells, Home lighting systems, Solar lanterns, Solar PV pumps, Solar energy storage options, Industrial process heat systems, Solar thermal power generation and sterling engine, Solar economics. (14 L)

Text book:

1. Robert Foster, Majid Ghassemi, Alma Cota. Solar Energy: Renewable Energy and the Environment. August 18, 2009 by CRC Press