Established by UP Govt. Act No. 07 of 2015
Recognized by U.G.C. under section 2 (f) of Act-1956

Value Added Courses

Faculty of Mechanical Engineering

	J.S. University, Shikohabad Faculty of Mechanical engineering	Value Added Course
		AY: 2018-2019

FUNDAMENTALS OF SOLAR ENERGY

Learning Objective:

This Course will provide knowledge of Solar Energy.

Duration: 35 Hours. (Theory and Practical)

Course Outcomes: -

After completion of the course the student shall be able to:-

1. Create awareness about sources of energy and able to estimate how long the available conventional fuel reserves will last.
2. Learn the fundamental concepts about solar energy systems and devices
3. Conceptual knowledge of the technology, economics and regulation related issues associated with solar power development and management
4. Ability to analyse the viability of solar power projects
5. Capability to integrate various options and assess the business and policy environment regarding solar power projects

	J.S. University, Shikohabad Faculty of Mechanical engineering	Value Added Course
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Syllabus

Module I: Introduction

Energy Scenario, overview of solar energy conversion devices and applications, physics of propagation of solar radiation from the sun to earth, Energy Scenario, overview of solar energy conversion devices and applications, physics of propagation of solar radiation from the sun to earth.

Module 2 : Solar radiations and Solar PV cells

Estimation of solar radiation under different climatic conditions, Estimation of total radiation. Fundamentals of solar PV cells, principles and performance analysis, modules, arrays, theoretical maximum power generation from PV cells

Module 3 : PV system

PV standalone system components, Standalone PV-system design, : Components of grid-connected PV system, solar power plant design and performance analysis, Fundamentals of solar collectors, Snails law, Bougers law, Physical significance of Transmissivity - absorptivity product.

Module 4: Liquid flat plate collectors and Solar Air heater

Performance analysis of Liquid flat plate collectors and testing, Performance analyses of Solar Air heaters and testing solar thermal power generation (Solar concentrators)

Module 5: Thermal Energy Storage and Applications of solar energy.

Thermal Energy Storage (sensible, latent and thermochemical) and solar pond, Applications: Solar Refrigeration, Passive architecture, solar distillation, and ermeging technologies.

References:-

1. Sukhatme. S.P., Solar Energy, Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997.
2. B. H. Khan, Non-Conventional Energy Resources, , The McGraw Hill
3. Twidell, J.W. & Weir, A. Renewable Energy Sources, EFN Spon Ltd., UK, 2006.
4. S.P. Sukhatme and J.K. Nayak, Solar Energy – Principles of Thermal Collection and Storage, Tata McGraw-Hill, New Delhi.
5. Garg, Prakash, Solar Energy, Fundamentals and Applications, Tata McGraw Hill.

Dr. Swatantra Kr. Pathak

Dean Academics
Dr. P. P. Singh

Dean
Dr. Brajesh Bajpai

	J.S. University, Shikohabad Faculty of Mechanical engineering	**Value Added Course**
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