Course Number and Name													
BEE043 & Solar Energy Utilization													
Credits and Contact Hours													
3 & 45		• • •											
Course Coo	<u>rdinato</u>	r's Nan	ne										
Mrs.V.Suma	thi	0											
Text Books	and Re	ference	S										
 Sukhatme, K. Suhas P. Sukhatme, "Solar energy: Principles of thermal collection and storage", Tata McGraw Hill publishing Co. Ltd, 8th edition,2008. 													
2. Soteris	2. Soteris A. Kalogiru, "Solar Energy Engineering: Processes and systems", 1st edition,												
Academic press, 2009.													
References:													
1. Duffie.J.A, &Beckman.W.A, "Solar Engineering of Thermal Processes", 3 rd edition, John													
Wiley & Sons, Inc., 2006.													
2. Martin A. Green, "Third generation Photovoltaics: Advanced energy conversion", 1st edition, 2005.													
3. Garg.H.P, Prakash.J, "Solar energy fundamentals and applications", Tata McGraw Hill													
publishing Co. Ltd, 2006.													
4. http://nptel.ac.in/courses/112105051/22													
Course Description													
To enable the students to acquire knowledge of solar energy fundamentals and various applications.													
Prerequisites Co-requisites													
Renewable Energy Sources NIL													
required, elective, or selected elective (as per Table 5-1)													
Required													
Course Outcomes (COs)													
CO1: Analyze Solar radiation data and its measurement													
CO2: Understand Operation of solar thermal energy systems													
CO3: Under	stand th	e workli	ig of so. voltaic fl	heory a	entrator	s and th montati	on proc		to prod	uce ener	gу		
CO ₅ : Under	stand th	e design	of Sola	r consci	ious bui	Idings		635					
Student Outcomes (SOs) from Criterion 3 covered by this Course													
COs/SOs	a	b	c	d	e	f	g	h	i	i	k		
CO1	M	Н	Н	Н	Н		0	М	M	H			
CO2			М	М	М					М			
CO3	М		М	М					М				
CO4		М	М				М	М					
CO5			М		М	М	М						
List of Topics Covered													
UNIT I	SOI	LAR RA	ADIATI	ION						9	•		

Sun and earth geometry, solar radiation-beam and diffuse radiations, measurement of solar radiation -

pyranometer, pyrheliometer, sunshine recorder. Solar collectors and applications.

UNIT II SOLAR THERMAL SYSTEMS

Flat plate and evacuated tube collectors, domestic hot water and process heat systems, solar cooker, solar dryer, solar desalination and solar pond.

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UNIT III SOLAR POWER PLANT

Principles of solar parabolic concentrators-trough and dish types, compound parabolic concentrators, Fresnel lens collectors, central receiver plant, direct steam generation systems, solar furnaces.

UNIT IV SOLAR PHOTOVOLTAICS

Solar photo voltaic theory, mono and polycrystalline silicon technologies, PV modules and integrated systems, implementation and maintenance.

UNIT V SOLAR-CONSCIOUS BUILDINGS

Orientation and design of buildings, passive solar heat- thermal capacity, insulation, solar cooling-refrigeration and air-conditioning, space heating, sensible and latent heat energy storages in buildings.