



H.K.E. Society's
**B.V. BHOOMARADDI COLLEGE OF ARTS, SCIENCE
AND COMMERCE, BIDAR**



DEPARTMENT OF PHYSICS

Value added course
On
Solar energy fundamentals
2020-21

Course co-ordinator

Prof. Nagnath Sarode
Associate Professor in Physics

IKE Society's
B V BHOMARADDI COLLEGE OF ARTS, SCIENCE AND
COMMERCE, BIDAR
Department of Physics
Value Added Course 2020-21

Course Name : Solar Energy Fundamentals
Duration : 30 Hrs
Course Co-ordinator : Prof. Nagnath Sarode
Event Co-ordinator : Ms. Radha. B
Time of Course : 05:00 to 06:00pm Theory Classes on Saturday
10:00am to 11:00am Theory Classes on Sunday
11:30am to 12:30pm Assignments on Sunday

Number of Students : 25

Name of the Lecturers

1. Prof. Nagnath Sarode
2. Ms Radha.B

HKE Society's
B V BHOMARADDI COLLEGE OF ARTS, SCIENCE AND COMMERCE, BIDAR
Department of Physics
Value Added Course in "Solar Energy Fundamentals " 2020-21

Course Description :

Solar Energy: The Need of the Hour

"All energy is ultimately derived for the sun and harvesting it directly through solar power seems to be the best way to transition to renewable energy."

Traditionally, the sun has provided energy for practically all living creatures on earth, through the process of photosynthesis, in which plants absorb solar radiation and convert it into stored energy for growth and development. Scientists and engineers today seek to utilize solar radiation directly by converting it into useful heat or electricity.

INSTITUTIONAL BOARD OF STUDIES

Sl.No	Name	Institution	Designation
1	Prof. Nagnath Sarode	HOD (Physics) B.V.B Degree college Bidar	Asso. Prof. Chairman
2	Ms Radha.B	Department of Physics B.V.B Degree college Bidar	Full time Guest Lecturer
3	Shri Ashok Bajolgekar	Department of Physics Karnataka Degree college, Bidar	External Member Guest Lecturer

see

Radha

Gay


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B.V. BHoomARADDI COLLEGE OF ARTS, SCIENCE AND COMMERCE, BIDAR

DEPARTMENT OF PHYSICS

Value Added Course -2020-2021 in " solar energy fundamentals "
Theory Time Table : 5pm -6pm on SAT & 10am-11am on SUNDAY

Sl. No	Date	Days
1	05 December 2020	Saturday
2	06 December 2020	Sunday
3	12 December 2020	Saturday
4	13 December 2020	Sunday
5	19 December 2020	Saturday
6	20 December 2020	Sunday
7	26 December 2020	Saturday
8	27 December 2020	Sunday
9	02 January 2021	Saturday
10	03 January 2021	Sunday
11	09 January 2021	Saturday
12	10 January 2021	Sunday
13	16 January 2021	Saturday
14	17 January 2021	Sunday
15	23 January 2021	Saturday
16	24 January 2021	Sunday
17	30 January 2021	Saturday
18	31 January 2021	Sunday
19	06 February 2021	Saturday
20	07 February 2021	Sunday



**HOD
HEAD**

**Department of Physics
B.V.B. College, BIDAR.**



PRINCIPAL

**B.V.Bhoomaraddi College
of Arts, Science & Commerce
BIDAR-585 403.**

Assignment Time Table (Time: 11:30-12:30pm)		
1	06 December 2020	Sunday
2	13 December 2020	Sunday
3	20 December 2020	Sunday
4	27 December 2020	Sunday
5	03 January 2021	Sunday
6	10 January 2021	Sunday
7	17 January 2021	Sunday
8	24 January 2021	Sunday
9	31 January 2021 (Extra 12:30pm-2:30pm)	Sunday
10	07 February 2021	Sunday

Date: 25/11/2020

To,
The Principal
HKE Society's B V Bhoomaraddi College of Arts, Science and Commerce, Bidar

Sub: Request to grant permission to start add-on course on solar energy fundamentals from the academic year 2020-21: Reg.

Respected Sir,

As per the guidelines issued by IQAC, we would like to start the add-on course on solar energy fundamentals from the academic year 2020-21 with intake of 25 students. Please permit us to start the add-on course and do the needful.

Thanking You.

for
Praveen
HOD
HEAD
Department of Physics
B.V.B. College, BIDAR.

[Signature]
PRINCIPAL
B.V. Bhoomaraddi Degree College
of Arts, Science & Commerce
Bidar-585 403.

H.K.E. Society's

B.V. BHOOMARADDI COLLEGE OF ARTS, SCIENCE AND COMMERCE, BIDAR

DEPARTMENT OF PHYSICS

Report and Outcome Analysis

Name of the course: solar energy fundamentals

Name of the Department: Physics

Number of students Enrolled: 25

BOS Meeting Date:23/11/2020

Start Date of the course: 05 December 2020

End Date of the course: 07 February 2021

The Department of Physics have conducted add-on course on “**solar energy fundamentals**” for the students of B.Sc from 05 December 2020 to 07 February 2021.

The course was about the basic concept of solar energy production, Development of solar cells and various advantages of solar cells.

The total of 25 students were enrolled in this course and they got fundamental knowledge of solar energy, solar cells and applications like heating, cooling, cooking etc. Students also applied these theories and concepts during the assignments.

Course concluded with final examination and certificate distributions.

Course Outcome (Advantage of the Course):

- Understand the modes of heat transfer
- Describe the use of solar energy and the various components used in the energy production with respect to applications like - heating, cooling, desalination, power generation, drying, cooking etc
- Understand the applications of solar air heaters
- Acquire the knowledge of solar cells, fundamentals and its classifications.
- Students can construct their own company , firm to become entrepreneur.
- They can get the jobs in solar panel construction companies as a Technician, Assistant.

DISTRIBUTION OF SYLLABUS IN HOURS
(Theory-20 hours and Assignment 10 Hours)

Sl. No	Theory syllabus to be covered	Duration in Hours
1	Unit 1: <ul style="list-style-type: none"> • An introduction to solar energy- • Modes of heat transfer-(Conduction, convection and radiation), • Spectral distribution of solar radiation. 	3hrs
2	Unit2: <ul style="list-style-type: none"> • Solar Air Heaters and their Applications- Introduction, types of air heaters, • performance of solar air heaters, • application of solar air heaters, heating and drying of agricultural products. 	5hrs
3	Unit3: <ul style="list-style-type: none"> • Solar Water heaters and their applications- • Introduction , types of solar water heaters, • collectors and storage tanks, loads and the sizing of the system, • freezing temperature, characteristics and their performance. 	6hrs
4	Unit4: Solar Cells- <ul style="list-style-type: none"> • An introduction to solar cell and its types, • solar cells fundamentals, (I-V & P-V characteristics), • classification of solar cell, advantages of disadvantages of solar cell. 	6hrs

Sl.No.	Assignments to be covered	Duration in Hours
1	<ul style="list-style-type: none"> • Analysis of Spectral distribution of solar radiation. 	2hrs
2	<ul style="list-style-type: none"> • construction and working of solar air heaters 	2hrs
3	<ul style="list-style-type: none"> • Different Types of solar water heaters 	2hrs
4	<ul style="list-style-type: none"> • Construction & Working of solar cell 	2hrs
5	<ul style="list-style-type: none"> • Study of different types of solar cells & I-V P-V characteristics , Advantages & Disadvantages. 	2hrs

Course Outcome (Advantage of the Course):

- Understand the modes of heat transfer
- Describe the use of solar energy and the various components used in the energy production with respect to applications like - heating, cooling, desalination, power generation, drying, cooking etc
- Understand the applications of solar air heaters
- Acquire the knowledge of solar cells, fundamentals and its classifications.
- Students can construct their own company , firm to become entrepreneur.
- They can get the jobs in solar panel construction companies as a Technician, Assistant.

KRE Society's
**HKE Society's B V Bhoomaraddi College of Arts, Science and
Commerce, Bidar**

Date: 26/11/2020

NOTICE

All the students are hereby informed that, the Department of Physics is starting the add-on course on solar energy fundamentals from **(05-12-2020)**, interested students can enrol their names on or before **(04-12-2020)** in the Department of Physics.



HOD

HEAD

Department of Physics
B.V.B. College, BIDAR.



Principal

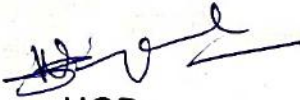
PRINCIPAL

B.V. Bhoomaraddi Degree College
BIDAR

H.K.E. Society's
B.V. BHOOMARADDI COLLEGE OF ARTS, SCIENCE AND COMMERCE, BIDAR
DEPARTMENT OF PHYSICS

NOTICE

All the students enrolled in add-on course on solar energy fundamentals are hereby informed that, the course examination is scheduled on 27/02/2021 from 10AM to 12 PM.


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BIDAR-585 403.

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B.V. BHOOMARADDI COLLEGE OF ARTS, SCIENCE AND COMMERCE, BIDAR


DEPARTMENT OF PHYSICS

List of Students for Value Added Course in " solar energy fundamentals"

NAME OF THE STUDENTS REGISTERED:

1	Chandrakant.k	Chandrakant.k
2	Manisha.S	Manisha
3	Deenarani.D	Deenarani
4	Aishwarya.A	Aishwarya
5	Rohit.k	Rohit.k
6	Samuel	Samuel
7	Vaishnavi.S	Vaishnavi
8	Usharani.N	Usharani
9	Akash.P	Akash.P
10	Shilpa.B	Shilpa
11	venkateshprasad	venkatesh
12	Rajkumar	Rajkumar
13	Tanuja	Tanuja
14	Johnson	Johnson
15	Nikita.P	Nikita
16	Radhika.N	Radhika
17	Varsha.C	Varsha
18	Ratika.H	Ratika
19	PremSagar.S	PremSagar
20	Ganesh .R	Ganesh
21	Anjali.R	Anjali
22	Maheshwar.S	Maheshwar
23	Baswaraj.B	Baswaraj
24	Panchal Purva	P.B.Panchal
25	Mamata Samuel	Mamata


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B.V. BHOOMARADDI COLLEGE OF ARTS, SCIENCE AND COMMERCE, BIDAR

DEPARTMENT OF PHYSICS

Value Added Course-2020-2021

Internal Assessment Test (Theory)

Paper: solar energy Fundamentals

Time: 40 Minutes

Max Marks: 10

Note:

1. Answer any two Questions.
2. Draw the diagram wherever necessary.

5x2=10

- Q 1.** Describe the spectral distribution of solar radiation.
2. Explain advantages of solar cells.
 3. Explain the construction & working of solar cell.

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DEPARTMENT OF PHYSICS

**Main Question Paper (Theory)
Value Added Course 2020-2021**

Paper: solar energy Fundamentals

Time: 2 hours

Max Marks: 40

Note:

1. Answer all the Questions.
2. Draw the diagram wherever necessary.

Q.No.1. Answer in brief any five of the following.

2×5=10

1. What is modes of heat transfer?
2. Define conduction.
3. Define convection.
4. Mention the types of air heaters.
5. Classify the types of solar water heaters.
6. What is solar cell?

Q.No.II. Answer any two of the following.

5x2=10

7. Describe the spectral distribution of solar radiation.
8. explain the applications of solar air heaters.
9. Explain advantages of solar cells.

Q.No. III. Answer any two of the following.

10x2=20

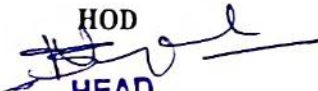
- 10 Describe the I-V Characteristics of solar cell.
11. Explain the construction & working of solar cell.
12. Explain in detail the characteristics of solar water heaters.

Roll No. 27
Sub: 101 marks

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B.V. BHOOMARADDI COLLEGE OF ARTS, SCIENCE AND COMMERCE, BIDAR
DEPARTMENT OF PHYSICS

Value Added Course -2020-2021 in " solar energy fundamentals"
MARKS LIST

Sl. No.	Name of the Student	Internal Marks (10)	Main Exam (40)	Total Marks (50)
1	Chandrakant.k	08	36	44
2	Manisha.S	09	35	44
3	Deenarani.D	08	35	43
4	Aishwarya.A	10	38	48
5	Rohit.k	10	28	38
6	Samuel	08	22	30
7	Vaishnavi.S	09	21	30
8	Usharani.N	08	24	32
9	Akash.P	08	24	32
10	Shilpa.B	08	24	32
11	venkateshprasad	10	35	45
12	Rajkumar	08	25	33
13	Tanuja	08	24	32
14	Johnson	10	37	47
15	Nikita.P	10	30	40
16	Radhika.N	08	22	30
17	Varsha.C	08	22	30
18	Ratika.H	08	23	31
19	Premsagar.S	08	22	30
20	Ganesh .R	10	36	46
21	Anjali.R	08	22	30
22	Maheshwar.S	08	24	32
23	Baswaraj.B	09	25	34
24	Panchal Purva	10	32	42
25	Mamata Samuel	10	33	43

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B.V.B. College, BIDAR.


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Name: Ganesh R	Total Marks
Class: Sub:	
Roll No.: 07 Date:	

36
40

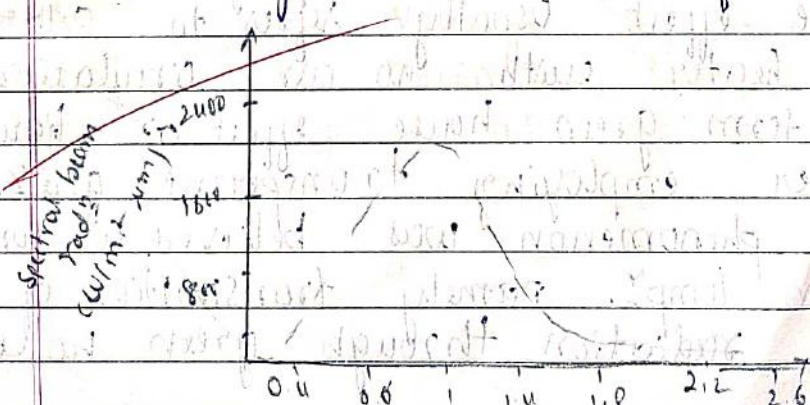
3. — ?
The mode of heat transfer are
1. Conduction
2. Induction
3. Radiation

4. — ?
1. Non-porous
2. porous absorber

5. — ?
1. Flat plate collector
2. Storage tank
3. Circulation System & auxillary heating System
4. Control of system

6. — ?
Spectral distribution of solar radiations

The spectral distribution of solar radiation: intensity at outer limit of atmosphere





H.K.E. SOCIETY'S

ESTD : 1960

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B.V. BHOMARADDI COLLEGE OF ARTS, SCIENCE & COMMERCE, BIDAR

(Affiliated to Gulbarga University, Kalaburagi)

Accredited with 'A' Grade by NAAC

Department of Physics

CERTIFICATE

This is to certify that Kum./Kumari Ganesh.R of
B.V.B College Bidar Bearing Register No. / Roll No. _____ has
Successfully completed add-on Course/Certificate course in Solar Energy Fundamentals
during the academic year 20.20..-20.21....

Head of the Dept.

IQAC Co-ordinator

Principal

H.K.E.
B.V. BHOMARADDI COLLEGE OF
Students Attendance

Academic Year 2020-21

Sl. No.	Roll No.	Reg. No.	Name of Student	Date	No. of Class																				
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15						
1.			Chandubhai K.		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
2.			Manisha S.		A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
3.			Deenamani D.		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
4.			Aishwarya A.		A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
5.			Rohit B.		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
6.			Samuel		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
7.			Vaishnavi S.		A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
8.			Usharani N.		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
9.			Akath P.		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
10.			Shilpa R.		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
11.			Venkateshprasad		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
12.			Rajkumar		A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
13.			Tanya		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
14.			Johnson		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
15.			Nikita P.		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
16.			Radhika N.		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
17.			Vaisha C.		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
18.			Ratika H.		A	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
19.			Premasagar S.		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
20.			Ganesh R.		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
21.			Anjali R.		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
22.			Maheshwari S.		A	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
23.			Baswaraj R.		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
24.			Panchaj Putva.		A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
25.			Mamab Samuel.		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

Signature of Lecturer with Date

Society's
ARTS, SCIENCE & COMMERCE, Bidar
Register

Class	Subject	Days																																		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
16		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	
17		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
18		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
19		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
20		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
21		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
22		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
23		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
24		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
25		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

Bidar

Subject	Total Classes Engaged	Total Classes Attended	Percentage of Attendance	Remarks
	30	24	90%	
	30	26	87%	
	30	28	93%	
	30	26	87%	
	30	29	97%	
	30	26	87%	
	30	27	90%	
	30	24	80%	
	30	27	90%	
	30	25	83%	
	30	26	87%	
	30	27	90%	
	30	29	97%	
	30	26	87%	
	30	25	83%	
	30	28	93%	
	30	26	87%	
	30	24	80%	
	30	26	87%	
	30	28	93%	
	30	27	90%	
	30	28	93%	
	30	29	97%	
	30	28	93%	
	30	28	93%	

Principal