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

2021-22

Course co- ordinator

Prof. Shivraj Gadi Patil

Associate Professor in Physics

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

Department of Physics

Value Added Course 2021-22

Course Name : solar energy fundamentals
Duration : 30 Hrs
Course Co-ordinator : Prof. Shivraj Gadi Patil
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. Shivraj Gadi Patil
2. Ms Radha.B

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Department of Physics

Value Added Course in " solar energy Fundamentals" 2021-22

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. Shivraj Gadi Patil	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

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

Department of Physics

Value Added Course in " solar energy Fundamentals" 2021-22

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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

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DEPARTMENT OF PHYSICS

Value Added Course -2021-2022 in " solar energy fundamentals "

Theory Time Table : 5pm -6pm on SAT & 10am-11am on SUNDAY

Sl. No	Date	Days
1	06 November 2021	Saturday
2	07 November 2021	Sunday
3	13 November 2021	Saturday
4	14 November 2021	Sunday
5	20 November 2021	Saturday
6	21 November 2021	Sunday
7	27 November 2021	Saturday
8	28 November 2021	Sunday
9	04 December 2021	Saturday
10	05 December 2021	Sunday
11	11 December 2021	Saturday
12	12 December 2021	Sunday
13	18 December 2021	Saturday
14	19 December 2021	Sunday
15	25 December 2021	Saturday
16	26 December 2021	Sunday
17	01 January 2022	Saturday
18	02 January 2022	Sunday
19	08 January 2022	Saturday
20	09 January 2022	Sunday

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

Principal

PRINCIPAL
B.V. Bhoomaraddi Degree College
BIDAR

Assignment Time Table (Time: 11:30-12:30pm)		
1	07 November 2021	Sunday
2	14 November 2021	Sunday
3	21 November 2021	Sunday
4	28 November 2021	Sunday
5	05 December 2021	Sunday
6	12 December 2021	Sunday
7	19 December 2021	Sunday
8	26 December 2021	Sunday
9	02 January 2022 (Extra 12:30pm-2:30pm)	Sunday
10	09 January 2022	Sunday

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Principal

PRINCIPAL
B.V. Bhoomaraddi Degree College
BIDAR

Date: 22/10/2021

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 2021-22: 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 2021-22 with intake of 25 students. Please permit us to start the add-on course and do the needful.

Thanking You.

for Radhika
HOD

Department of Physics

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

PRINCIPAL

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

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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: 25/10/2021

Start Date of the course: 06 November 2021

End Date of the course: 09 January 2022

The Department of Physics have conducted add-on course on "**solar energy fundamentals**"for the students of B.Sc from 06 November 2021 to 09 January 2022.

The course was about the basic concept of solar energy production, Development of solar cells and various advantatges 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:** • **An introduction to solar energy-** • Modes of heat transfer-(Conduction, convection and radiation), • Spectral distribution of solar radiation.	3hrs
2	**Unit2:** • **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:** • **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-** • 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	• Analysis of Spectral distribution of solar radiation.	2hrs
2	• construction and working of solar air heaters	2hrs
3	• Different Types of solar water heaters	2hrs
4	• Construction & Working of solar cell	2hrs
5	• 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.

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Date: 02/11/2021

NOTICE

All the students are hereby informed that, the Department of Physics is starting the add-on course on solar energy fundamentals from **(06-11-2021),** interested students can enrol their names on or before **(05-11-2021)** in the Department of Physics.

for
HOD

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

Principal

PRINCIPAL
B.V.Bhoomaraddi College
of Arts, Science & Commerce
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	Nivedita.S	
2	Aarati	
3	B.Vaishnavi	
4	Pavan.B	
5	Arun kumar	
6	Mahadev.V	
7	Omnath	
8	Dipika	
9	Akshata	
10	Manikeshwari	
11	Sujata	
12	Abdul.R	
13	Raghavendra.S	
14	Anilkumar.S	
15	Ganesh.V	
16	Akash	
17	Krishnaveni	
18	Saniya	
19	Gayatri.N	
20	Shantlingayya	
21	Archana.V	
22	Aarati.S	
23	Asha.C	
24	Sadhana	
25	Vishnudas	

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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 29/01/2022 from 10AM to 12 PM.

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DEPARTMENT OF PHYSICS

Value Added Course-2021-2022

Internal Assessment Test (Theory)

Paper: solar energy Fundamentals

Time: 40 Minutes **Max Marks: 10**

Note:

Answer any two Questions. **5x2=10**

Draw the diagram wherever necessary.

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 2021-2022

Paper: solar energy Fundamentals

Time: 2 hours **Max Marks: 40**

Note:

Answer all the Questions.

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 Radiation.
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.

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

DEPARTMENT OF PHYSICS

Value Added Course -2021-2022 in " solar energy fundamentals"

MARKS LIST

Sl. No.	Name of the Student	Internal Marks (10)	Main Exam (40)	Total Marks (50)
1	Nivedita.S	09	35	44
2	Aarati	08	36	44
3	B.Vaishnavi	08	35	43
4	Pavan.B	10	38	48
5	Arun kumar	10	28	38
6	Mahadev.V	08	22	30
7	Omnath	09	21	30
8	Dipika	09	26	35
9	Akshata	08	24	32
10	Manikeshwari	08	24	32
11	Sujata	10	35	45
12	Abdul.R	07	28	35
13	Raghavendra.S	08	24	32
14	Anilkumar.S	10	37	47
15	Ganesh.V	10	30	40
16	Akash	09	24	33
17	Krishnaveni	08	22	30
18	Saniya	08	23	31
19	Gayatri.N	08	22	30
20	Shantlingayya	10	36	46
21	Archana.V	08	22	30
22	Aarati.S	08	24	32
23	Asha.C	10	28	38
24	Sadhana	08	32	40
25	Vishnudas	09	35	44

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BIDAR

Name : Akshata D. Gandhi	Total Marks
Class : BSc IT Sub :	
Roll No.: 28 Date :	

24/10

_____?

1 _____?

The modes of heat transfer are.
1 : Conduction
2 : Induction
3 : Radiation

09

4 _____?

1 : Non-porous absorber
2 : porous absorber

07

5 _____?

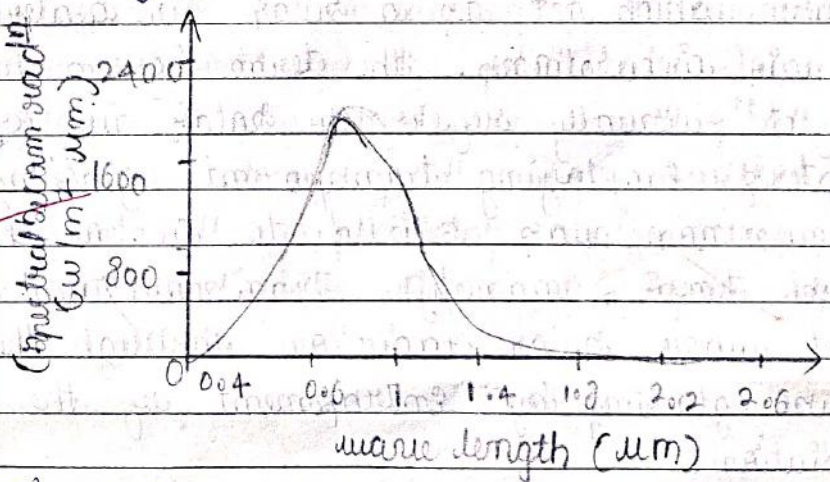
1) Flat plate collector
2) Storage tank
3) Circulation system & auxiliary heating system
4) Control of the system

07

7 _____?

Spectral distribution of Solar Radiation :-

The spectral distribution of solar radiation intensity at the outer limit of the atmosphere.



04

The solar radiation in various portion of the spectrum show in below table the area under the entire is the solar radiation.

H.K.E. SOCIETY'S

ESTD : 1960

ಬಿ.ವಿ. ಭೂಮರಡ್ಡಿ ಕಲಾ, ವಿಜ್ಞಾನ ಹಾಗೂ ವಾಣಿಜ್ಯ ಮಹಾವಿದ್ಯಾಲಯ, ಬೀದರ

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

(Affiliated to Gulbarga University, Kalaburagi)

Department of PHYSICS

CERTIFICATE

This is to certify that Kum./Kumari AKSHATA *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* 2021-2022.

Head of the Dept. *IQAC Co-ordinator* *Principal*

H.K.E.

B.V. BHOOMARADDI COLLEGE OF

Society's

ARTS, SCIENCE & COMMERCE, Bidar

Students Attendance — **Register**

Academic Year 2021-22 — **Class** — **Subject**

Sl. No.	Roll No.	Reg. No.	Name of Student	Date / No. of Class	6/Nov/21	7/Nov/21	13/Nov/21	14/Nov/21	20/Nov/21	21/Nov/21	27/Nov/21	28/Nov/21	4/Dec/21	5/Dec/21	11/Dec/21	12/Dec/21	18/Dec/21	19/Dec/21	25/Dec/21	26/Dec/21	01/Jan/22	02/Jan/22	8/1/22	9/1/22	15/1/22	16/1/22	21/1/22	23/1/22	5/2/22	12/2/22	19/2/22	26/2/22	2/3/22	9/3/22
					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
01.			Nivedita. S		P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	A
02.			Arati		P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	A	P	P	P	P	P
03.			B. Vaishnavi		P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
04.			Pavan. B		P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
05.			Arun Kumar		P	A	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
06.			Mahadev. V		P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P
07.			Omnath		P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
08.			Dipika		P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P
09.			Akshata		P	P	A	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	A
10.			Manikeshwari		P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P
11.			Sujata		P	P	P	P	A	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
12.			Abdul. R		P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P
13.			Raghvendra. S		P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
14.			Anil kumar. S		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
15			Ganesh. V		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
16.			Akash		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.			Krishnaveni		P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	A	P
18.			Saniya		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P
19.			Gayatri		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P
20.			Shantlingayya		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	A	P	P	P	P
21.			Archana. V		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.			Arati. S		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	A	P	P	P	P
23			Asha. C		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.			Sadhana		A	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	A	P
25.			Vishudas		P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	A	P	P	P	P	A
			Signature of Lecturer with Date		Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha	Radha