From

Dr. Sailaja U
The Head of the Department
Department of Physics
MES Keveeyam College, Valanchery

To

The principal

MES Keveeyam College, Valanchery

Sir,

Sub: Request for the Approval of Certificate Course

The Department of Physics is planning to conduct a Certificate Course on **"Fundamentals of Photovoltaics"** of 30 hours duration for the final year UG and first and second year PG students. So kindly grant permission for the same.

Thanking you

Yours faithfully,

Dr. Sailaja U

Dr. Sailaja U
Head of the Department
Department of Physics
MES KEVEEYAM COLLEGE
Valanchery, 676552

Place: Valanchery

Date: 08/08/2022

MES KVM COLLEGE, VALANCHERY - 676 552
DEPARTMENT OF PHYSICS
Date .....

SHAJID P P
ASSISTANT PROFESSOR
IN CHARGE OF PRINCIPAL
M.E.S KEVEEYAM COLLEGE
VALANCHERY, PIN 676 552

From

Dr. Sailaja U
Head of the Department
Department of Physics
MES Keveeyam College, Valanchery

To

The Principal
MES Keveeyam College, Valanchery

Sir,

Sub: Request for the Approval of Board of Studies for the short Term Course

The following academicians may be included in the Board of Studies for the Short Term Course on "Certificate Course in Fundamentals of Photovoltaics" to be conducted by the Department of Physics with these members.

1. Asha, Assistant Professor, TMG College, Tirur
2. Sailaja U, Associate Professor, MES Keveeyam college, Valanchery
3. Muhammed Shibu K, Assistant Professor, MES Keveeyam college, Valanchery
4. Dr. Nabeel Rashin, Assistant Professor, MES Keveeyam college, Valanchery
5. Dr. Navas M P, Assistant Professor, MES Keveeyam college, Valanchery
6. Lubna A, Assistant Professor, MES Keveeyam college, Valanchery

Thanking you

Yours faithfully

Dr. Sailaja U
Head of the Department
Department of Physics
MES KEVEEYAM COLLEGE
Valanchery, 676552

Place: Valanchery

Date: 11/08/2022

DEPARTMENT OF PHYSICS
Date .....
MES KVM COLLEGE, VALANCHERY - 676 552

SHAJID PP
ASSISTANT PROFESSOR
IN CHARGE OF PRINCIPAL
M.E.S KEVEEYAM COLLEGE
VALANCHERY, PIN 676 552

Minutes of Board of Studies Meeting

Date: 16/08/2022

Time: 2:00 PM – 4:00 PM

Location: Department of Physics

Attendees

1. Asha, Assistant Professor, TMG College, Tirur
2. Sailaja U, Associate Professor, MES Keveeyam college, Valanchery
3. Muhammed Shibu K, Assistant Professor, MES Keveeyam college, Valanchery
4. Dr. Nabeel Rashin, Assistant Professor, MES Keveeyam college, Valanchery
5. Dr. Navas M P, Assistant Professor, MES Keveeyam college, Valanchery
6. Lubna A, Assistant Professor, MES Keveeyam college, Valanchery

Agenda

1. Opening remarks by HOD
2. Presentation of Proposal for Certificate Course on "Fundamentals of Photovoltaics Techniques" by Dr. Navas M P
3. Discussion on Course Content and Structure
4. Discussion on Approval Process and Timeline
5. Discussion on Resource Allocation and Faculty Involvement
6. Closing remarks by Dr. Navas M P

Decisions

1. Decide to conduct a certificate course on "Fundamentals of Photovoltaics Techniques"
2. Dr. Navas M P is assigned as coordinator
3. The members discussed the proposed content of syllabus
4. Board agreed to conduct the course from 12th September 2022 to 15th November 2022
5. HOD proposed the involvement of all faculty members from the department on conduction of the course

Action Item

1. Coordinator : Lubna A
2. Finalize Course Content – Lubna A and Dr. Sailaja U, HOD
   Dead line: 24/08/2022

3. Prepare approval documents – Lubna A
4. Launch course – Entire team

Meeting Adjourned

Minutes prepared by: . Lubna A

These minutes will be circulated to all committee members for their reference & review

DEPARTMENT OF PHYSICS
Date .....
MES KVM COLLEGE, VALANCHERY - 676 552

Dr Sailaja. U
Head of the Department
Department of Physics
MES KEVEEYAM COLLEGE
Valanchery, 676552

SHAJID UP
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MES KEVEEYAM COLLEGE
VALANCHERY

P.O.Valanchery, Malappuram Dist, Kerala, Pin:676 552.
Phone : 0494-2642670, 0494 2644380
www.meskeveeyamcollege.ac.in,
principal@meskeveeyamcollege.ac.in

Reaccredited with 'A+' Grade by NAAC (Score 3.44)

Aided by Govt. of Kerala and Affiliated to the University of Calicut
ISO 9001:2015 certified institution

Proceedings of the Principal, MES Keveeyam College, Valanchery

Sub: Certificate Course – Reg.

Ref : (1) Request from the head of the Department of Physics, Dated 08.08.2022.

(2) Minutes of the Board of Studies Meeting for approval of the syllabus Dated 11.08.2022

ORDER

As per the reference cited (1), a request was received from the Head of the Department of Physics to start a certificate course on **Fundamentals of Photovoltaics** for the third year UG, First and Second year PG students. In the same letter, the head of the Department has recommended a panel of academicians to be included in the Board of Studies.

The Board of Studies for the above course is constituted of the following members

1. Asha, Assistant Professor, TMG College, Tirur
2. Sailaja U, Associate Professor, MES Keveeyam college, Valanchery
3. Muhammed Shibu K, Assistant Professor, MES Keveeyam college, Valanchery
4. Dr. Nabeel Rashin, Assistant Professor, MES Keveeyam college, Valanchery
5. Dr. Navas M P, Assistant Professor, MES Keveeyam college, Valanchery
6. Lubna A, Assistant Professor, MES Keveeyam college, Valanchery

Sanction is hereby accorded to the Department of Physics for conducting the above-referred certificate course.

Order is issued accordingly.

Principal

SHAJID P P
ASSISTANT PROFESSOR
IN CHARGE OF PRINCIPAL
M.E.S KEVEEYAM COLLEGE
VALANCHERY, PIN 676 552

Copy to:

1. **HoD, Department of Physics**
2. **File**

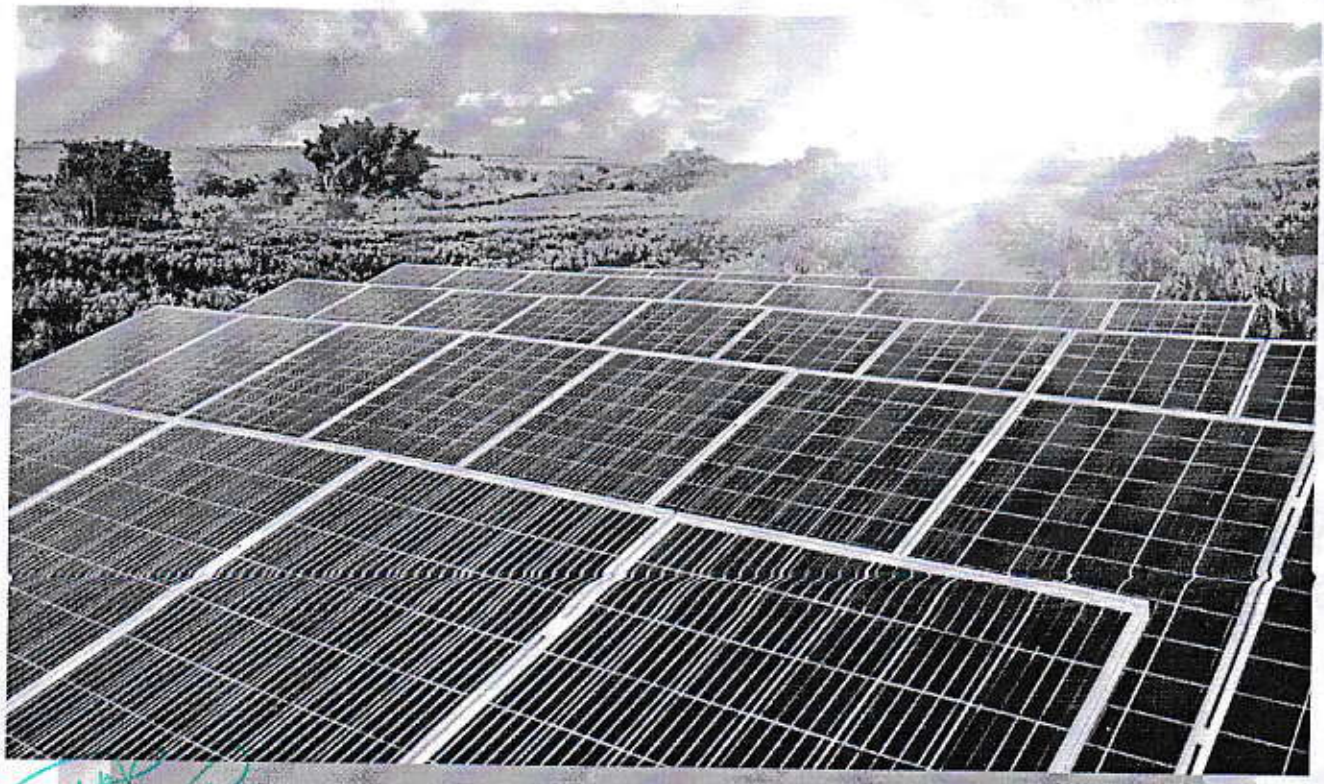
MES KEVEEYAM COLLEGE, VALANCHERY

MALAPPURAM | KERALA | NAAC Reaccredited with A+ Grade (3.44)

DEPARTMENT OF PHYSICS

ORGANISING

FUNDAMENTALS OF PHOTOVOLTAICS



COURSE STARTS FROM

12 SEPTEMBER 2022

DURATION 30 HOURS

SHAJID P P
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M.E.S KEVEEYAM COLLEGE
VALANCHERY
DEPARTMENT OF PHYSICS
Date .....
MES KVM COLLEGE, VALANCHERY - 676 552

physics@meskeveeyamcollege.ac.in

www.meskeveeyamcollegee.ac.in

Head of the Department
Department of Physics
MES KEVEEYAM COLLEGE
Valanchery, 676552

MES KEVEEYAM COLLEGE VALANCHERY

DEPARTMENT OF PHYSICS

CERTIFICATE COURSE

KVM/CC/PHY/22-23/02– **FUNDAMENTALS OF PHOTOVOLTAICS**

30 hrs

Objectives:

- Gain a comprehensive understanding of the scientific principles underlying solar energy conversion.
- Explore different generations of solar cell technologies, including crystalline silicon, thin film, and emerging options like perovskite and organic solar cells.
- Master the techniques used for device fabrication and characterization in solar cell development.
- Analyse the design considerations for optimizing solar cell efficiency and performance.
- Identify and evaluate various industrial applications of solar energy technologies.

Outcomes:

By the end of this course, students will be able to:

- Explain the fundamental physics of solar cell operation, including charge carrier generation, recombination, and p-n junction formation.
- Analyze the factors influencing solar cell efficiency and identify strategies for improvement.
- Compare and contrast different solar cell technologies based on their materials, fabrication processes, and performance characteristics.
- Discuss the applications of solar energy in various industries, including power generation, green buildings, and nanotechnology integration.
- Apply their knowledge to critically evaluate the feasibility and potential of solar energy solutions for real-world problems.

Scheme of evaluation

- Written Examination (Conventional) : 40 marks
- Assignment : 10 marks
- Total : 50 marks

A Grade: 80% and above, B Grade: 60 – 79%, C Grade: 40 – 59%, below 40% D Grade

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DEPARTMENT OF PHYSICS
Date .....
M.E.S KVM COLLEGE, VALANCHERY - 676 552

Dr. Sailaja. U
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Department of Physics
MES KEVEEYAM COLLEGE
Valanchery, 676552

MES KEVEEYAM COLLEGE VALANCHERY
DEPARTMENT OF PHYSICS
KVM/CC/PHY/22-23/02– Fundamentals of Photovoltaics

SYLLABUS
(2022- 2023)

Unit 1: Fundamentals and Device Physics of Photovoltaics (8 hours)

Introduction to course and review of semiconductor physics, Charge carrier generation and recombination, p-n junction model and depletion capacitance, Current-voltage characteristics in dark and light, Device physics of solar cells, Principle of solar energy conversion and conversion efficiency, Single, tandem, and multi-junction solar cells

Unit 2: Solar Cell Technologies and Modeling (10 hours)

Numerical solar cell modeling, Crystalline silicon and III-V solar cells, Thin film solar cells: Amorphous silicon and Quantum Dot solar cells, Introduction to Dye Sensitized Solar Cells, Fabrication and design of novel dyes, solid electrolyte materials, and counter electrode engineering

Unit 3: Advanced Concepts and Applications in Photovoltaics (12 hours)

Introduction to Organic Solar Cells, Physics of Bulk Heterojunction (BHJ) Solar Cells, Morphology and charge separation in BHJ, Design of low bandgap polymers, Perovskite Solar Cells, Fabrication and photophysics of perovskite solar cells, Stability and lead-free perovskite solar cells, Photovoltaic system engineering, Thermo-Photovoltaic generation of electricity, Concentration and storage of electrical energy, Photovoltaics modules, systems, and applications, Green energy building, Nanomaterials for photovoltaics, PV panels with nanostructures, Band gap and optical engineering, Photo thermal cells, Energy economy and management

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DEPARTMENT OF PHYSICS
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MES KVM COLLEGE, VALANCHERY - 676 552

Dr. Sailaja U
Head of the Department
Department of Physics
MES KEVEEYAM COLLEGE
Valanchery, 676552

MES KEVEEYAM COLLEGE VALANCHERY

DEPARTMENT OF PHYSICS

TIMETABLE FOR CERTIFICATE COURSE ON FUNDAMENTALS OF PHOTOVOLTAICS (10/08/22 TO 15/10/22)

Sl. no.	Date	Day	Name of the faculty engaging the class	time
1.	12/09/22	Monday	Dr. Navas M P	3.30-4.30
2.	14/09/22	Wednesday	Dr. Nabeel Rashin M	3.30-4.30
3.	16/09/22	Friday	Dr. Navas M P	3.30-4.30
4.	19/09/22	Monday	Dr. Nabeel Rashin M	3.30-4.30
5.	21/09/22	Wednesday	Lubna A	3.30-4.30
6.	23/09/22	Friday	Mohammed Shibu	3.30-4.30
7.	25/09/22	Monday	Dr. Sailaja U	3.30-4.30
8.	28/09/22	Wednesday	Lubna A	3.30-4.30
9.	30/09/22	Friday	Lubna A	3.30-4.30
10.	03/10/22	Monday	Dr. Navas M P	3.30-4.30
11.	05/10/22	Wednesday	Dr. Nabeel Rashin M	3.30-4.30
12.	07/10/22	Friday	Dr. Navas M P	3.30-4.30
13.	10/10/22	Monday	Lubna A	3.30-4.30
14.	12/10/22	Wednesday	Lubna A	3.30-4.30
15.	14/10/22	Friday	Mohammed Shibu	3.30-4.30
16.	17/10/22	Monday	Dr. Navas M P	3.30-4.30
17.	19/10/22	Wednesday	Dr. Nabeel Rashin M	3.30-4.30
18.	26/10/22	Wednesday	Dr. Navas M P	3.30-4.30
19.	28/10/22	Friday	Dr. Nabeel Rashin M	3.30-4.30
20.	31/10/22	Monday	Lubna A	3.30-4.30
21.	01/11/22	Tuesday	Mohammed Shibu	3.30-4.30
22.	02/11/22	Wednesday	Dr. Sailaja U	3.30-4.30
23.	03/11/22	Thursday	Lubna A	3.30-4.30
24.	04/11/22	Friday	Lubna A	3.30-4.30
25.	07/11/22	Monday	Dr. Navas M P	3.30-4.30

26.	08/11/22	Tuesday	Dr. Nabeel Rashin M	3.30-4.30
27.	09/11/22	Wednesday	Dr. Navas M P	3.30-4.30
28.	10/11/22	Thursday	Lubna A	3.30-4.30
29.	11/11/22	Friday	Lubna A	3.30-4.30
30.	15/11/22	Tuesday	Mohammed Shibu	3.30-4.30

Dr. Navas M P - 8 hr

Dr. Nabeel Rashin M - 6 hr

Lubna A - 10 hrs

Dr. Sailaja U - 2 hr

Mohammed Shibu K - 4 hrs

DEPARTMENT OF PHYSICS
Date .....
MES KVM COLLEGE, VALANCHERY - 676 552

Dr. Sailaja U
Head of the Department
Department of Physics
MES KEVEEYAM COLLEGE
Valanchery, 676552

SHAJID P P
ASSISTANT PROFESSOR
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M.E.S KEVEEYAM COLLEGE
VALANCHERY, PIN 676 552

MES KEVEEYAM COLLEGE VALANCHERY
Department of Physics
KVM/CC/PHY/22-23/02– Fundamentals of Photovoltaics

Sl No	Name of the students	Class	Date														
			12/09	14/09	16/09	19/09	21/09	23/09	25/09	28/09	30/09	3/10	5/10	7/10	10/10	12/10	14/10
1.	Amrin A	III BSc Physics							Ab	Ab	Ab						Ab
2.	Arshitha K	III BSc Physics		Ab		Ab		Ab				Ab	Ab	Ab			
3.	Ashmiya Anchu P	III BSc Physics															
4.	Fathima Murshida S P	III BSc Physics							Ab		Ab						
5.	Fathima Nusriyya	III BSc Physics							Ab	Ab						Ab	
6.	Muhammed Rafeekh P K	III BSc Physics	Ab			Ab					Ab				Ab		
7.	Raniya K	III BSc Physics															

SHAJID P P
ASSISTANT PROFESSOR
IN CHARGE OF PRINCIPAL
M.E.S KEVEEYAM COLLEGE
VALANCHERY, PIN 676 552

8.	Sayedath Sahana V T	III BSc Physics							Ab							Ab	
9.	Shibla Nasreen P	III BSc Physics			Ab								Ab				Ab
10.	Suhana C	III BSc Physics				Ab				Ab	Ab						
11.	Ummu Ayisha	III BSc Physics												Ab			
12.	Ajal Krishna A	III BSc Physics					Ab										Ab
13.	Althaf Kareem	III BSc Physics			Ab												
14.	Ardra S	III BSc Physics															
15.	Fathima Reneesha P	III BSc Physics				Ab											
16.	Jasim P K	III BSc Physics						Ab					Ab				
17.	Mehsaf Ali T M	III BSc Physics				Ab						Ab					
18.	Muhamed Shameem K P	III BSc Physics					Ab		Ab		Ab						

SHAJID P P
ASSISTANT PROFESSOR
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M.E.S KEVEEYAM COLLEGE
VALANCHERY, PIN 676 552

19.	Saadlyya	III BSc Physics								Ab						
20.	Saheedul Fayis K	III BSc Physics					Ab									
21.	Shamna Shirin K P	III BSc Physics														
22.	Varsha K	III BSc Physics														
23.	Ansad Kp	III BSc Physics							Ab							
24.	Anshad K T	III BSc Physics					Ab									
25.	Arjun Vk	III BSc Physics								Ab						
26.	Ashima Das V	III BSc Physics										Ab				
27.	Fathima Hiba P A	III BSc Physics														
28.	Gayathri P K	III BSc Physics			Ab											
29.	Midulaj	III BSc Physics										Ab				
30.	Muhammed Adhilshan	III BSc Physics				Ab.										

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VALANCHERY, PIN 676 552

	M A																
31.	Nabeel M P	III BSc Physics							Ab			Ab				Ab	
32.	Pranav V E	III BSc Physics					Ab	Ab						Ab			
33.	Sangeetha T P	III BSc Physics															
34.	Shifana Sherin M	III BSc Physics						Ab	Ab					Ab		Ab	
35.	Swathi K K	III BSc Physics							Ab	Ab				Ab		Ab	
36.	Anaswara K	I MSc Physics									Ab						
37.	Arshitha K	I MSc Physics															Ab
38.	Bilana E P	I MSc Physics		Ab					Ab								
39.	Fathima Nasnin K	I MSc Physics								Ab							
40.	Fathima P C	I MSc Physics					Ab					Ab					
41.	Fathima Sona C	I MSc Physics					Ab					Ab					

SHAJID P P
ASSISTANT PROFESSOR
IN CHARGE OF PRINCIPAL
M.E.S KEVEEYAM COLLEGE
VALANCHERY, PIN 676 552

42.	Fida P V	I MSc Physics	Fid	Fid	Fid	Fid	Fid	Fid	Fid	Fid	Fid	Fid	A	Fid	Fid	Fid	A
43.	Husna M	I MSc Physics	Hi	Hi	Hi	Hi	Hi	Hi	A	Hi	Hi	Hi	A	Hi	Hi	Hi	Hi
44.	Husna Nasrin	I MSc Physics	Nas	Nas	Nas	Nas	Nas	Nas	Nas	Nas	A	Nas	Nas	A	Nas	Nas	Nas
45.	Rizma M T	I MSc Physics	Riz	Riz	Riz	Riz	Riz	Riz	Riz	Riz	Riz	A	Riz	Riz	A	Riz	Riz
46.	Shaheera K T	I MSc Physics	Sha	Sha	Sha	Sha	Sha	Sha	Sha	Sha	Sha	Sha	Sha	Sha	Sha	Sha	A
47.	Pranav P	I MSc Physics	Prana	Prana	Prana	A	Prana	A	Prana	Prana	Prana	Prana	Prana	Prana	Prana	Prana	Prana
48.	Ranjith C P	I MSc Physics	CP	CP	CP	A	CP	CP	CP	A	CP	CP	CP	CP	CP	CP	CP
49.	Adeela K K	II MSc Physics	Ad	Ad	Ad	Ad	Ad	A	Ad	Ad	Ad	Ad	Ad	Ad	Ad	Ad	A
50.	Aiswaryalakshmi M S	II MSc Physics	As	As	As	As	As	As	A	As	As	As	A	As	As	As	As
51.	Akshaya V P	II MSc Physics	AK	AK	AK	A	AK	AK	A	AK	AK	AK	AK	AK	AK	AK	AK
52.	Kadeeja Sahira N T	II MSc Physics	Kad	A	Kas	Kas	Kas	Kas	Kas	Kas	Kas	Kas	Kas	Kas	A	Kas	Kas
53.	Muhsina V K	II MSc Physics	Muh	Muh	Muh	Muh	Muh	Muh	A	Muh	Muh	Muh	Muh	Muh	Muh	Muh	A

SHAJID P P
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54.	Najiya V M	II MSc Physics														
55.	Rasha Musthafa	II MSc Physics														
56.	Rimshi Paravath	II MSc Physics														
57.	Riya Mariyam M	II MSc Physics														
58.	Sneha P V	II MSc Physics														
59.	Faris A	II MSc Physics														

Signature of teachers who had engaged the sessions

Dr. Navas. MP

Muhammed Shiba

Signature of HoD

Head of the Department
Department of Physics
MES KEVEEYAM COLLEGE
Valanchery, 676552

Department seal

DEPARTMENT OF PHYSICS
Date .....
MES KVM COLLEGE, VALANCHERY - 676 552

Signature of Principal

SHAJID P P
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MES KEVEEYAM COLLEGE VALANCHERY
Department of Physics
KVM/CC/PHY/22-23/02– Fundamentals of Photovoltaics

Sl No	Name of the students	Class	Date														
			17/10	19/10	26/10	28/10	31/10	1/11	2/11	3/11	4/11	7/11	8/11	9/11	10/11	11/11	15/11
1.	Amrin A	III BSc Physics				Ab					Ab						
2.	Arshitha K	III BSc Physics	Ab	Ab	Ab			Ab	Ab	Ab			Ab	Ab	Ab		
3.	Ashmiya Anchu P	III BSc Physics					Ab	Ab							Ab	Ab	Ab
4.	Fathima Murshida S P	III BSc Physics													Ab		
5.	Fathima Nusriyya	III BSc Physics													Ab		Ab
6.	Muhammed Rafeekh P K	III BSc Physics	Ab	Ab			Ab					Ab			Ab	Ab	
7.	Raniya K	III BSc Physics						Ab						Ab			

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8.	Sayedath Sahana V T	III BSc Physics					Ab								Ab		
9.	Shibla Nasreen P	III BSc Physics												Ab					Ab
10.	Suhana C	III BSc Physics				Ab				Ab	Ab						
11.	Ummu Ayisha	III BSc Physics												Ab			
12.	Ajal Krishna A	III BSc Physics					Ab										
13.	Althaf Kareem	III BSc Physics			Ab	Ab											
14.	Ardra S	III BSc Physics															
15.	Fathima Reneesha P	III BSc Physics												Ab			
16.	Jasim P K	III BSc Physics				Ab								Ab			
17.	Mehsaf Ali T M	III BSc Physics				Ab					Ab						
18.	Muhamed Shameem K P	III BSc Physics					Ab		Ab		Ab						

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19.	Saadlyya	III BSc Physics								Ab						
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22.	Varsha K	III BSc Physics										Ab				
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24.	Anshad K T	III BSc Physics								Ab						
25.	Arjun Vk	III BSc Physics												Ab		
26.	Ashima Das V	III BSc Physics														
27.	Fathima Hiba P A	III BSc Physics														
28.	Gayathri P K	III BSc Physics														
29.	Midulaj	III BSc Physics														
30.	Muhammed Adhilshan	III BSc Physics														

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M.E.S KEVEEYAM COLLEGE
VALANCHERY, PIN 676 552

	M A																
31.	Nabeel M P	III BSc Physics										Ab			Ab		
32.	Pranav V E	III BSc Physics										Ab		Ab			
33.	Sangeetha T P	III BSc Physics						Ab		Ab				Ab			
34.	Shifana Sherin M	III BSc Physics															
35.	Swathi K K	III BSc Physics							Ab			Ab			Ab		
36.	Anaswara K	I MSc Physics							Ab					Ab			
37.	Arshitha K	I MSc Physics															
38.	Bilana E P	I MSc Physics															
39.	Fathima Nasnin K	I MSc Physics					Ab								Ab		
40.	Fathima P C	I MSc Physics						Ab									
41.	Fathima Sona C	I MSc Physics															

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42.	Fida P V	I MSc Physics	Fid	Fid	Fid	Fid	Fid	Fid	A	Fid	Fid	Fid	Fid	A	Fid	Fid	Fid
43.	Husna M	I MSc Physics	Hi	Hi	Hi	Hi	Hi	Hi	Hi	Hi	Hi	Hi	A	Hi	A	Hi	Hi
44.	Husna Nasrin	I MSc Physics	Nas	Nas	Nas	Nas	Nas	Nas	Nas	Nas	Nas	Nas	A	Nas	Nas	Nas	A
45.	Rizma M T	I MSc Physics	Riz	Riz	Riz	Riz	Riz	Riz	Riz	Riz	Riz	A	Riz	Riz	A	Riz	Riz
46.	Shaheera K T	I MSc Physics	A	Sha	Sha	Sha	Sha	Sha	Sha	A	Sha	Sha	Sha	Sha	Sha	Sha	Sha
47.	Pranav P	I MSc Physics	Pran	Pranv	Pranv	Pranv	Pranv	Pranv	Pran	Pranv	Pranv	Pran	A	Pran	Pran	Pran	A
48.	Ranjith C P	I MSc Physics	CP	CP	CP	A	CP	CP	CP	A	CP	CP	CP	CP	CP	CP	CP
49.	Adeela K K	II MSc Physics	Ad	Ad	Ad	Ad	Ad	A	Ad	Ad	Ad	A	Ad	Ad	Ad	Ad	Ad
50.	Aiswaryalakshmi M S	II MSc Physics	AK	AK	AK	AK	AK	AK	A	AK	AK	AK	A	AK	AK	AK	AK
51.	Akshaya V P	II MSc Physics	AK	AK	AK	A	AK	AK	A	AK	AK	AK	AK	AK	AK	AK	AK
52.	Kadeeja Sahira N T	II MSc Physics	Km	A	Km	Km	Km	Km	Km	Km	Km	Km	Km	A	Km	Km	Km
53.	Muhsina V K	II MSc Physics	Muh	Muh	Muh	Muh	Muh	Muh	Muh	A	Muh	A	Muh	Muh	Muh	Muh	Muh

SHAJID P P
ASSISTANT PROFESSOR
IN CHARGE OF PRINCIPAL
M.E.S KEVEEYAM COLLEGE
VALANCHERY, PIN 676 552

54.	Najiya V M	II MSc Physics															
55.	Rasha Musthafa	II MSc Physics															
56.	Rimshi Paravath	II MSc Physics															
57.	Riya Mariyam M	II MSc Physics															
58.	Sneha P V	II MSc Physics															
59.	Faris A	II MSc Physics															

Signature of teachers who had engaged the sessions

Dr. Navas. M.P

Muhammad Shiba

Signature of HoD

Head of the Department
Department of Physics
MES KEVEEYAM COLLEGE
Valanchery, 676552

Department seal

DEPARTMENT OF PHYSICS
Date .....
MES KVM COLLEGE, VALANCHERY - 676 552

Signature of Principal

SHAJID P P
ASSISTANT PROFESSOR
IN CHARGE OF PRINCIPAL
M.E.S KEVEEYAM COLLEGE
VALANCHERY, PIN 676 552

MES KEVEEYAM COLLEGE VALANCHERY, DEPARTMENT OF PHYSICS

KVM/CC/PHY/22-23/02 **FUNDAMENTALS OF PHOTOVOLTAICS**

Time: 90min **Max marks: 40**

SECTION A (Answer all questions, 1 mark each)

1. True or False: The photovoltaic effect is based on the principle of quantum tunneling.

2. Fill in the blank: The bandgap energy of silicon is approximately _____ eV.

3. The open-circuit voltage (Voc) of a solar cell is determined by the _____ of the p-n junction.

4. The unit of measurement for solar cell efficiency is _____.

5. Which of the following materials is commonly used as a transparent conductive oxide (TCO) in solar cells?

a) Indium tin oxide (ITO) b) Aluminum zinc oxide (AZO)

c) Gallium arsenide (GaAs) d) Silicon dioxide (SiO_2)

SECTION B (Answer any 5 questions, 2 marks each)

6. What is the principle of photovoltaic effect?

7. What is the function of a blocking diode in a solar panel?

8. What is the function of a charge controller?

9. Define fill factor (FF).

10. What is the purpose of a mounting system?

11. What is the role of a fuse in a solar panel circuit?

12. Define open-circuit voltage (Voc).

SECTION C (Answer any 5 questions, 3 marks each)

13. Explain the difference between monocrystalline and polycrystalline solar cells.

14. Describe the process of photon absorption in a solar cell.

15. What are the factors affecting the efficiency of a solar panel?

16. Explain the concept of maximum power point tracking (MPPT).

17. Describe the difference between series and parallel connections of solar panels.

18. What is the purpose of a ground fault protection system in a solar panel installation?

19. Explain the concept of temperature coefficient in solar panels.

SECTION D (Answer any 2 questions, 5 marks each)

1. Explain the construction and working of a solar cell, including the p-n junction and depletion region.

2. Describe the design considerations and components of a grid-connected photovoltaic system, including the role of inverters and net metering. (5 marks)

3. Explain the Fabrication and photophysics of perovskite solar cells

DEPARTMENT OF PHYSICS
Date .....
MES KVM COLLEGE, VALANCHERY - 676 552

Head of the Department
Department of Physics
MES KEVEEYAM COLLEGE
Valanchery, 676552

SHAJID P P
ASSISTANT PROFESSOR
IN CHARGE OF PRINCIPAL
M.E.S KEVEEYAM COLLEGE
VALANCHERY, PIN 676 552

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DEPARTMENT OF PHYSICS

CERTIFICATE COURSE ON FUNDAMENTALS OF PHOTOVOLTAICS

(12/09/22 TO 15/11/22)

LIST OF CERTIFIED STUDENTS

SL. No	NAME OF THE STUDENTS	Class	Mark	Certification
1	Amrin A	III BSc Physics	42	Certified
2	Arshitha K	III BSc Physics	44	Certified
3	Ashmiya Anchu P	III BSc Physics	46	Certified
4	Fathima Murshida S P	III BSc Physics	41	Certified
5	Fathima Nusriyya	III BSc Physics	49	Certified
6	Muhammed Rafeekh P K	III BSc Physics	47	Certified
7	Raniya K	III BSc Physics	43	Certified
8	Sayedath Sahana V T	III BSc Physics	48	Certified
9	Shibla Nasreen P	III BSc Physics	40	Certified
10	Suhana C	III BSc Physics	50	Certified
11	Ummu Ayisha	III BSc Physics	42	Certified
12	Ajal Krishna A	III BSc Physics	39	Certified
13	Althaf Kareem	III BSc Physics	45	Certified
14	Ardra S	III BSc Physics	50	Certified
15	Fathima Reneesha P	III BSc Physics	44	Certified
16	Jasim P K	III BSc Physics	41	Certified
17	Mehsaf Ali T M	III BSc Physics	48	Certified
18	Muhamed Shameem K P	III BSc Physics	46	Certified
19	Saadlyya	III BSc Physics	49	Certified
20	Saheedul Fayis K	III BSc Physics	43	Certified
21	Shamna Shirin K P	III BSc Physics	40	Certified

22	Varsha K	III BSc Physics	44	Certified
23	Ansad Kp	III BSc Physics	42	Certified
24	Anshad K T	III BSc Physics	49	Certified
25	Arjun Vk	III BSc Physics	47	Certified
26	Ashima Das V	III BSc Physics	39	Certified
27	Fathima Hiba P A	III BSc Physics	50	Certified
28	Gayathri P K	III BSc Physics	45	Certified
29	Midulaj	III BSc Physics	41	Certified
30	Muhammed Adhilshan M A	III BSc Physics	48	Certified
31	Nabeel M P	III BSc Physics	47	Certified
32	Pranav V E	III BSc Physics	43	Certified
33	Sangeetha T P	III BSc Physics	44	Certified
34	Shifana Sherin M	III BSc Physics	40	Certified
35	Swathi K K	III BSc Physics	42	Certified
36	Anaswara K	I MSc Physics	46	Certified
37	Arshitha K	I MSc Physics	49	Certified
38	Bilana E P	I MSc Physics	45	Certified
39	Fathima Nasnin K	I MSc Physics	39	Certified
40	Fathima P C	I MSc Physics	50	Certified
41	Fathima Sona C	I MSc Physics	48	Certified
42	Fida P V	I MSc Physics	47	Certified
43	Husna M	I MSc Physics	44	Certified
44	Husna Nasrin	I MSc Physics	41	Certified
45	Rizma M T	I MSc Physics	43	Certified
46	Shaheera K T	I MSc Physics	40	Certified

47	Pranav P	I MSc Physics	42	Certified
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58	Sneha P V	II MSc Physics	46	Certified
59	Faris A	II MSc Physics	50	Certified

DEPARTMENT OF PHYSICS
Date .....
MES KVM COLLEGE, VALANCHERY - 676 552

Dr. Sailaja. U
Head of the Department
Department of Physics
MES KEVEEYAM COLLEGE
Valanchery, 676552

SHAJID P P
ASSISTANT PROFESSOR
IN CHARGE OF PRINCIPAL
M.E.S KEVEEYAM COLLEGE
VALANCHERY, PIN 676 552

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This is to certify that

RANIYA K.

has successfully completed the certificate course on "FUNDAMENTALS OF PHOTOVOLTAICS" conducted by the Department of PHYSICS, MES Keveeyam College, Valanchery during the period 2022-23.

CO-ORDINATOR

HEAD OF DEPARTMENT

Dr. K.P. VINOD KUMAR
PRINCIPAL

M.E.S. Ke Yee Yam College
Date:
Valanchery

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SUHANA C

has successfully completed the certificate course on "FUNDAMENTALS OF PHOTOVOLTAICS" conducted by the Department of PHYSICS, MES Keveeyam College, Valanchery during the period 2022-23.

CO-ORDINATOR

HEAD OF DEPARTMENT

Dr. K.P. VINOD KUMAR
PRINCIPAL

M.E.S. Ke Vee Yam College Valanchery
Date: