PANCHAKOT MAHAVIDYALAYA

SARBARI, NETURIA, PURULIA

Affiliated to SidhoKanho Birsha University, Purulia

Department of Chemistry

Add-on/ Certificate Course

Green Energy and Sustainability

Session: 2021-22

Brochure

Panchakot Mahavidyalaya

SARBARI, NETURIA, PURULIA, WEST BENGAL

NO FEES

Green Energy and Sustainability

Add On Course, Dept. of Chemistry

Duration: 32 hrs.

For detailed schedule log-on to: www.panchakotmv.ac.in

Course Coordinator: Dr. S M Wahidur Rahaman, Dept. of Chemistry

About This Course: The modern civilization is dependent upon energy more than ever in the past. Staring from a small cell phone to large scale industries, all are driven by energy. The demand for energy by modern human civilization is increasing rapidly with the establishment of new metropolitan cities and large scale industries all over the world. But today's main energy sources (fossil fuels) are finite and long-term effects of their use is detrimental for the environment. This enforces us to look for 'green energy' sources, such as sunlight, wind, tides, rain, waves, geothermal heat, bio-mass and bio-fuel.

Aim: This course is designed to make students aware of following:
(1) Utilization of abundant natural energy resources to reduce dependency on fossil fuels (2) Latest technologies used to harness green energy from nature (3) Lowering carbon emission, greenhouse gases and hence global warming in order to protect Mother Nature.

Module 1 : India's current energy scenario, drawbacks of fossil fuels, need for green energy , Photovoltaic technology, Organic and perovskite solar cells, Solar thermal devices (8 hrs.)

Module 2 : Various types of wind turbines and grid interconnections, Marine power: wave energy devices, tidal and osmotic power, OTEC technology, Hydroelectricity, formation of dams, rain water harvesting (8 hrs.)

Module 3 : Fonts & spacing, Biomass energy: utilization of agricultural, animal and industrial wastes, Geo-thermal power, hot springs, Piezoelectric, electromagnetic and nuclear energy: environmental impact. Our responsibility to build a sustainable future and conclusion (8 hrs.)

Module 4: Generating thermo-electricity from temperature difference of water, Operating small fans, buzz, LEDs using solar cells, Variation of solar power with light intensity, shielding, and wavelength, Calculation of V_{oc} , J_{sc} , FF and efficiency of solar cell from the I -V characterization (8 hrs.)

Who can participate?

Students from any stream with a basic scientific understanding and awareness of environment can join this course.

To
The Principal
Panchakot Mahavidyalaya
Sarbari, Neturia, Purulia

Applicant: Dr. S. M. Wahidur Rahaman, Department of Chemistry

Subject: Proposal for certificate course in 'Green Energy and Sustainability' for the session 2021-2022

Respected Sir,

The above mentioned subject, I am submitting herewith the proposal to conduct the certificate course in 'Green Energy and Sustainability' by the department of Chemistry of our college. This course will discuss (1) the utilization of abundant natural energy resources to reduce dependency on fossil fuels (2) latest technologies used to harness green energy from nature (3) lowering carbon emission, greenhouse gases and hence global warming in order to protect Mother Nature.
Hope you will consider my application and I kindly request you to sanction the same.

Date: 18.03.2022

Place: Sarbari

Your sincerely,
HOD, Chemistry

Enclosure: (1) Proposal
(2) Curriculum of the course

PANCHAKOT MAHAVIDYALAYA
SARBARI, NETURIA, PURULIA
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Proposal for conducting Short Term Certificate Courses
Session: (2021-2022)

1. **Details of the applicant department:**

I. Name of the college: Panchakot Mahavidyalaya,
II. Address of the college: Sarbari, PO: Neturia, District: Purulia, Pin: 723121
III. Name of the applicant department: Chemistry

2. **Details of the course proposed:**

I. Name of the course: Green Energy and Sustainability
II. Target participants: Undergraduate students from any stream
III. Duration of the course: 32 hrs.
IV. Medium of instruction: English

3. **Details of the faculty:**

I. Whether the college provides degree related to the proposed course: No
II. Whether the course is prepared by experts from related field: yes (by departmental faculty)
III. Information of course coordinator:

Name	Department	Qualification
Dr. S. M. Wahidur Rahaman	Chemistry	Ph. D. (Chemistry)

IV. Details of faculty members to be appointed for this course:

Sr. No.	Name	Department	Qualification
1	Dr. S. M. Wahidur Rahaman	Chemistry	Ph. D. in Chemistry
2	Dr. Sourav Chatterjee	Chemistry	Ph.D. in Chemistry

4. **Details of the infrastructure needed/available for this course:**
I. Classroom: Available
II. Books: Available in central library
III. Computer facility: Computer lab and departmental computer facility

Signature of Course coordinator

PANCHAKOT MAHAVIDYALAYA

SARBARI, NETURIA, PURULIA

Affiliated to Sidho Kanho Birsha University, Purulia

Department of Chemistry

Certificate course in Green energy and sustainability
Syllabus (2021-2022)

Duration: 32 hrs

Module 1 (8 hours):
India's current energy scenario (1 hr),
Drawbacks of fossil fuels (1.5 hrs),
Need for green energy (1 hr),
Photovoltaic technology (1 hr),
Organic and perovskite solar cells (1.5),
Solar thermal devices (2 hrs).

Module 2 (8 hours):
Various types of wind turbines and grid interconnections (2 hrs)
Marine power: wave energy devices, tidal and osmotic power, OTEC technology (4 hrs),
Hydroelectricity, formation of dams, rain water harvesting (2 hrs).

Module 3 (8 hours):
Fonts & spacing (1 hr),
Biomass energy: utilization of agricultural, animal and industrial wastes (2.5 hrs),
Geo-thermal power, hot springs, Piezoelectric, electromagnetic and nuclear energy: environmental impact (3 hrs),
Our responsibility to build a sustainable future and conclusion (1.5 hrs).

Module 4 (8 hours):
Generating thermo-electricity from temperature difference of water (1.5 hrs),
Operating small fans, buzz, LEDs using solar cells (1.5 hrs),
Variation of solar power with light intensity, shielding, and wavelength (2 hrs),
Calculation of Voc ,Jsc , FF and efficiency of solar cell from the I-V characterization (3 hrs).

Assessment: Written Test and/or Viva-Voce

Signature
Course Coordinator

PANCHAKOT MAHAVIDYALAYA

SARBARI, NETURIA, PURULIA

Affiliated to SidhoKanho Birsha University, Purulia

Department of Chemistry

Certificate course in Green energy and Sustainability
Session: (2021-2022)

Course coordinator: Dr. S. M. Wahidur Rahaman, HOD, Chemistry

Details of the Course

Course Objective: The course deliver into India's energy scenario, highlighting fossil fuel drawbacks and the urgency for green energy adoption. The course explores photovoltaic technology, including organic and perovskite solar cells, and solar thermal devices. Additionally, various wind turbine types, marine power technologies, and hydroelectricity methods are discussed. Biomass energy utilization, environmental impacts of different energy sources, and practical applications of thermo-electricity and solar-powered devices are also covered.

Schedule

Day	Hours	Timing/Duration	Resource Person	Venue	Topic
1	02	4:00-6:00 PM	Dr. S. M. Wahidur Rahaman (WR)	Dept of Chemistry	Module-I
2	02	4:00-6:00 PM	Dr. Sourav Chatterjee (SC)	Dept of Chemistry	Module-I
3	02	4:00-6:00 PM	WR	Dept of Chemistry	Module-I
4	02	4:00-6:00 PM	SC	Dept of Chemistry	Module-I
5	02	4:00-6:00 PM	WR	Dept of Chemistry	Module-II
6	02	4:00-6:00 PM	SC	Dept of Chemistry	Module-II

7	02	4:00-6:00 PM	WR	Dept of Chemistry	Module-II
8	02	4:00-6:00 PM	SC	Dept of Chemistry	Module-II
9	02	4:00-6:00 PM	WR	Dept of Chemistry	Module-III
10	02	4:00-6:00 PM	SC	Dept of Chemistry	Module-III
11	02	4:00-6:00 PM	WR	Dept of Chemistry	Module-III
12	02	4:00-6:00 PM	SC	Dept of Chemistry	Module-III
13	02	4:00-6:00 PM	WR	Dept of Chemistry	Module-IV
14	02	4:00-6:00 PM	SC	Dept of Chemistry	Module-IV
15	02	4:00-6:00 PM	WR	Dept of Chemistry	Module-IV
16	02	4:00-6:00 PM	SC	Dept of Chemistry	Module-IV

Expected Outcome: The outcome of this comprehensive energy course encompasses a deep understanding of India's energy landscape, emphasizing the drawbacks of fossil fuels and the urgency for green energy adoption. Participants gain insights into various renewable energy technologies, including photovoltaic systems, solar thermal devices, wind turbines, marine power options, hydroelectricity, and biomass energy. Additionally, they acquire practical skills in operating solar-powered applications and analyzing solar cell efficiency, contributing to a sustainable energy future.

Signature
Course Coordinator

PANCHAKOT MAHAVIDYALAYA

SARBARI, NETURIA, PURULIA

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Department of Chemistry

Certificate course in Green Energy and Sustainability
Session: (2021-2022)

Ref No:

Date: 24.03.2022

Notice

The Department of Chemistry at Panchakot Mahavidyalaya is pleased to announce upcoming Add On/Certificate courses entitled 'Certificate course in Green Energy and Sustainability' in offline mode from 01/04/2022 to 23/04/2022. If you're interested in enhancing your skills and knowledge, we encourage you to reach out to the department's designated teachers for more information and enrollment details.

HOD, Department of Chemistry
Principal,

Principal
PANCHAKOT MAHAVIDYALAYA
Sarbari, Neturia, Purulia

Panchakot Mahavidyalaya

Sarbari, Neturia, Purulia

PANCHAKOT MAHAVIDYALAYA

SARBARI, NETURIA, PURULIA

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Department of ...chemistry...

Certificate Course Name ...Green Energy and Sustainability...

Session: (20.21..-20.22..)

List of Enrolled Students

Sr. No.	Students Name	Roll Number	Semester	Student Signature
1	PIJUSH CHAKRABORTY	210000577	2	Pijush Chakraborty
2	APARNA GORAI	2100004164	2	Aparna Gorai
3.	SUDESHNA PAL	210000120	2	S. Pal
4.	MONISHA TUDU	210000807	sem2	MonishaTudu
5	KHAMA GOPE	210000495	II	Khama Gope

Principal
PANCHAKOT MAHAVIDYALAYA
Sarbari•Neturia•Purulia

Signature
Course Coordinator

PANCHAKOT MAHAVIDYALAYA
SARBARI, NETURIA, PURULIA

Affiliated to Sidho Kanho Birsha University, Purulia

Department of ..Chemistry....

Certificate Course : ..Green Energy and Sustainability.....

Session: (20.21....-20.22.....)

Attendance Sheet

Sr. No.	Name of Student	Day and Month															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.	PIJUSH CHAKRABORTY	P	P	P	P	P	P	P	.	P	P	P	P	P	P	P	P
2.	APARNA GORAI	P	P	P	P	P	P	P	P	P	P	P	P	P	.	P	P
3.	SUDESHNA PAL	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
4.	MONISHA TUDU	P	P	P	P	P	P	P	P	P	P	P	P	.	P	P	P
5.	KHAMA GOPE	P	P	P	P	P	P	.	P	P	P	P	P	P	P	P	P

Principal
PANCHAKOT MAHAVIDYALAYA
Sarbari•Neturia•Purulia

Course Coordinator

PANCHAKOT MAHAVIDYALAYA

SARBARI, NETURIA, PURULIA

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Department of ...Chemistry.....

Certificate Course:

...Green...Energy...and...Sustainability.....

Session: (2021.....-2022.....)

Result

Full Marks:

Sr. No.	Name of Student	Marks Obtained
1.	PIJUSH CHAKRABORTY	A
2.	APARNA GORAI	A
3.	SUDESHNA PAL	A
4.	MONISHA TUDU	A
5.	KHAMA GOPE	A

Principal
PANCHAKOT MAHAVIDYALAYA
Sarbari*Neturia*Purulia

Signature
Course Coordinator

PANCHAKOT MAHAVIDYALAYA

SARBARI, NETURIA, PURULIA

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Add On/ Certificate Course

Organized by: Department of ....Chemistry....

CERTIFICATE OF COMPLETION

Session: (20.21..-20.22.)

This is to certify that Mr./Ms ....PIJUSH CHAKRABORTY.....

of ....Geography (Hons.)..... Department has successfully completed Add On/Certificate course entitled:

....Green Energy and Sustainability.....

for session ....2021- 2022.....

Course Coordinator

HOD (Organizing Dept)

Principal

Principal
PANCHAKOT MAHAVIDYALAYA
Sarbari, Neturia, Purulia