

PANCHAKOT MAHAVIDYALAYA
SARBARI, NETURIA, PURULIA

Affiliated to Sidho Kanho Birsha University, Purulia



Department of Physics

Add-on/ Certificate Course

Thin Films and Their Device
Applications

Session: 2022-2023

Brochure



Panchakot Mahavidyalaya

SARBARI, NETURIA, PURULIA, WEST BENGAL

Thin Films and Their Device Applications

Add On Course, Dept. of Physics

Duration: 32 hrs.

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

Course Coordinator: Dr. Jayanta Das, HOD, Dept. of Physics

What is the aim of the course?

The aim of this value-added course is to provide students with a comprehensive grasp of the intricate domain of memory devices. It commences by establishing a solid foundation in magnetic materials, magnetism, and the dynamic interplay of charge and spin. Building upon this groundwork, the course introduces students to memory technologies, specifically magnetic memory. The journey continues by uncovering the inner workings of Hard Disk Drives (HDDs), Solid-State Drives (SSDs), magnetic tape storage, and Magnetic RAM (MRAM). Additionally, the course provides a comprehensive understanding of synthesis mechanisms for thin films which is essential for such device fabrication, encompassing critical techniques such as Molecular Beam Epitaxy, Physical Vapor Deposition, Chemical Vapor Deposition, and Laser Ablation.

➤ **Module 1 (8 hours):** Introduction to Magnetic Materials, Basics of Magnetism, Dynamics of Charge and Spin

➤ **Module 2 (8 hours):** Brief Introduction to Charge-based memory devices, Principles of Magnetic Memory, Magnetic Bit Storage, Writing and Reading Magnetic Bits, Spintronics and Magnetic Tunnel Junctions

➤ **Module 3 (8 hours):** Magnetic Storage Technologies, Hard Disk Drives (HDDs), Solid-State Drives (SSDs), Magnetic Tape Storage, Magnetic RAM (MRAM)

➤ **Module 4 (8 hours):** Basics of Synthesis Mechanisms of Thin Films, Molecular Beam Epitaxy, Physical Vapor Deposition, Chemical Vapor Deposition, Laser Ablation

To
The Principal
Panchakot Mahavidyalaya
Sarbari, Neturia, Purulia

Applicant: Dr. Jayanta Das, Department of Physics

Subject: Proposal for 'Thin Films and Their Device Applications' for the session
2022-2023

Respected Sir,

I am requesting you to see the course details which the department of physics is going to offer the college students in the session 2022-2023 in offline mode. The title of the course is 'Thin Films and Their Device Applications'. The course provides a comprehensive understanding of synthesis mechanisms for thin films which is essential for such device fabrication, encompassing critical techniques such as Molecular Beam Epitaxy, Physical Vapor Deposition, Chemical Vapor Deposition, and Laser Ablation.

I request that you please kindly sanction the mentioned course.

Date: 22/02/2023

Place: PKMV
Yours sincerely,



HOD, Physics

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: (2022-2023)

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: Physics

2. Details of the course proposed:

- I. Name of the course: Thin Films and Their Device Applications
- 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. Jayanta Das	Physics	Ph.D. in Physics

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

Sr. No.	Name	Department	Qualification
1	Dr. Jayanta Das	Physics	Ph.D. in Physics
2	Chandra Prasad Singha	Physics	M.Sc. in Physics

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 Physics

Certificate Course on Thin Films and Their Device Applications Syllabus (2022-2023)

Duration: 32 hrs

Module 1 (8 hours): Introduction to Magnetic Materials, Basics of Magnetism, Dynamics of Charge and Spin

Module 2 (8 hours): Brief Introduction to Charge-based memory devices , Principles of Magnetic Memory, Magnetic Bit Storage, Writing and Reading Magnetic Bits, Spintronics and Magnetic Tunnel Junctions

Module 3 (8 hours):Magnetic Storage Technologies, Hard Disk Drives (HDDs), Solid-State Drives (SSDs), Magnetic Tape Storage, Magnetic RAM (MRAM)

Module 4 (8 hours): Basics of Synthesis Mechanisms of Thin Films, Molecular Beam Epitaxy, Physical Vapor Deposition, Chemical Vapor Deposition, Laser Ablation

Assessment: Written Test and/or Viva-Voce



Signature
Course Coordinator

PANCHAKOT MAHAVIDYALAYA

SARBARI, NETURIA, PURULIA

Affiliated to Sidho Kanho Birsha University, Purulia

Department of Physics

Certificate Course on Thin Films and Their Device Applications

Session: (2022-2023)

Course coordinator: Dr. Jayanta Das, HOD, Physics

Details of the Course

Course Objective: The aim of this value-added course is to provide students with a comprehensive grasp of the intricate domain of memory devices. It commences by establishing a solid foundation in magnetic materials, magnetism, and the dynamic interplay of charge and spin. Building upon this groundwork, the course introduces students to memory technologies, specifically magnetic memory.

Schedule

Day	Hours	Timing/Duration	Resource Person	Venue	Topic
1	02	4:00-6:00 PM	Dr. Jayanta Das (JD)	Dept of Physics	Module 1
2	02	4:00-6:00 PM	Chandra Prasād Singha (CPS)	Dept of Physics	Module 1
3	02	4:00-6:00 PM	JD	Dept of Physics	Module 1
4	02	4:00-6:00 PM	CPS	Dept of Physics	Module 1
5	02	4:00-6:00 PM	JD	Dept of Physics	Module 2
6	02	4:00-6:00 PM	CPS	Dept of Physics	Module 2
7	02	4:00-6:00 PM	JD	Dept of Physics	Module 2
8	02	4:00-6:00 PM	CPS	Dept of Physics	Module 2
9	02	4:00-6:00 PM	JD	Dept of Physics	Module 3
10	02	4:00-6:00 PM	CPS	Dept of	Module 3

				Physics	
11	02	4:00-6:00 PM	JD	Dept of Physics	Module 3
12	02	4:00-6:00 PM	CPS	Dept of Physics	Module 3
13	02	4:00-6:00 PM	JD	Dept of Physics	Module 4
14	02	4:00-6:00 PM	CPS	Dept of Physics	Module 4
15	02	4:00-6:00 PM	JD	Dept of Physics	Module 4
16	02	4:00-6:00 PM	CPS	Dept of Physics	Module 4

Expected Outcome: The journey continues by uncovering the inner workings of Hard Disk Drives (HDDs), Solid-State Drives (SSDs), magnetic tape storage, and Magnetic RAM (MRAM). The course provides a comprehensive understanding of synthesis mechanisms for thin films which is essential for such device fabrication, encompassing critical techniques such as Molecular Beam Epitaxy, Physical Vapor Deposition, Chemical Vapor Deposition, and Laser Ablation.



Signature
Course Coordinator

PANCHAKOT MAHAVIDYALAYA

SARBARI, NETURIA, PURULIA

Affiliated to Sidho Kanho Birsha University, Purulia

Department of Physics

Certificate Course on Thin Films and Their Device Applications

Session: (2022-2023)

Ref No:

Date: 27.02.2023

Notice

This is to notify that the Department of Physics, Panchakot Mahavidyalaya is going to conduct an Add On/Certificate courses under the title as stated above. The course will be conducted from 04/03/23 to 31/03/23 in offline mode.

Interested students are requested to contact the concerned teacher(s) of the department/course coordinator for further course details (such as course duration, schedule, module etc.) as well as enrollment in the course.



HOD, Department of

Physics



Principal

PANCHAKOT MAHAVIDYALAYA

Sarbari, Neturia, Purulia

Principal,

Panchakot Mahavidyalaya

Sarbari, Neturia, Purulia

PANCHAKOT MAHAVIDYALAYA

SARBARI, NETURIA, PURULIA

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Department of *Physics*

Certificate Course Name *Thin Films and Their Device Applications*
Session: (20*22*-20*23*...)

List of Enrolled Students

Sr. No.	Students Name	Roll Number	Semester	Student Signature
1	HARIPADA MURMU	220000108	2	<i>Haripada Murmu</i>
2	SAMIRAN RAJAK	220000654	2	<i>Samiran Rajak</i>
3	TAPAS KAIBARTA	220000079	2	<i>Tapas Kaibarta</i>
4	AVEN MANDI	220001087	2	<i>Aven Mandy</i>
5	JAYASHRI BAURI	220000242	2	<i>Jayashri Bauri</i>
6	NISHA BAURI	220000442	2	<i>Nisha Bauri</i>
7	RAJIB BAURI	220000799	2	<i>Rajib Bauri</i>
8	PIJUSH CHAKRABORTY	210000577	4	<i>Pijush Chakraborty</i>
9	KHAMA GHOSE	210000495	1V	<i>Khama Ghose</i>

Self
Principal
PANCHAKOT MAHAVIDYALAYA
Sarbari, Neturia, Purulia

[Signature]
Signature
Course Coordinator

PANCHAKOT MAHAVIDYALAYA
SARBARI, NETURIA, PURULIA
 Affiliated to Sidho Kanho Birsha University, Purulia

Department of *Physics*

Certificate Course : *Thin Films and Their Device Application*

Session: (20.22...-20.23...)

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	HARIPADA MURMU	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
2	SAMIRAN RAJAK	P	P	P	P	P	.	P	P	P	P	P	P	P	P	P	P
3	TAPAS KAIBARTA	P	P	P	P	P	P	P	P	P	P	P	P	.	P	P	P
4	AVEN MANDI	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
5	JAYASHRI BAURI	P	P	P	P	P	P	P	.	P	P	P	P	P	P	.	P
6	NISHA BAURI	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
7	RAJI BAURI	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
8	PIJUSHI CHAKRABORTY	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
9	KHAMA GOPE	P	P	P	.	.	P	P	P	P	P	P	P	P	P	P	P

Self
 Principal
PANCHAKOT MAHAVIDYALAYA
 Sarbari-Neturia-Purulia

Dr. S. K. Das
 Course Coordinator

PANCHAKOT MAHAVIDYALAYA

SARBARI, NETURIA, PURULIA

Affiliated to Sidho Kanho Birsha University, Purulia

Department of*Physics*.....

Certificate Course:

.....*Thin Films and Their Device Application*.....

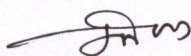
Session: (20.*22*...-20.*23*.)

Result

Full Marks:

Sr. No.	Name of Student	Marks Obtained
1	HARIPADA MURMU	A
2	SAMIRAN RAJAK	A
3	TAPAS KAI BARTA	A
4	AVEN MANDI	A
5	JAYA SHRI BAURI	A
6	NISHA BAURI	A
7	RAJI BAURI	B
8	PIJUSH CHAKRA BORTY	A
9	KHAMA GOPE	A


Principal
PANCHAKOT MAHAVIDYALAYA
Sarbari • Neturia • Purulia


Signature
Course Coordinator



Affiliated to Sidho Kanho Birsha University, Purulia
PANCHAKOT MAHAVIDYALAYA
SARBARI, NETURIA, PURULIA
Add On/ Certificate Course

Organized by: Department of *Physics*

CERTIFICATE OF COMPLETION

Session: (20.22.-20.23.)

This is to certify that Mr./Ms *HARIPADA MURMU*

of *Geography (Program)*..... Department has successfully completed Add

On/Certificate course entitled:

Thin Films and Their Device Application

for session *2022-2023*

[Signature]

Course Coordinator

[Signature]

HOD (Organizing Dept)

[Signature]

Principal

Principal

PANCHAKOT MAHAVIDYALAYA
Sarbari, Neturia, Purulia