

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



# Department of Physics

Add-on/ Certificate Course

## **Semiconductor Devices**

**Session: 2021-2022**



# Brochure



## Panchakot Mahavidyalaya

SARBARI, NETURIA, PURULIA, WEST BENGAL

### Semiconductor Devices

Add On Course, Dept. of Physics

Duration: 34 hrs.

For detailed schedule log-on to: [www.panchakotmv.ac.in](http://www.panchakotmv.ac.in)

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

**NO  
FEES**

#### **Content**

Module-I: Metal, Conductor, Insulator and Semiconductor. Structures, Charge Carriers, Electrons and Holes, Mobility, Electrical and thermal conductivity. Temperature dependence. (6 Hrs)

Module-II: Doping of semiconductors, p and n-type doping, P-N junctions, Diodes, Various types of diodes: Zener diode, Schottkey diode, Tunnel diode, Light Emitting Diode (LED). (8 Hrs)

Module-III: Bipolar Junction Transistors, P-N-P and N-P-N transistors, Transistor Biasing, Common Base (CB), Common Emitter (CE), Common Collector (CC) mode, Input-Output Characteristics, Cut-off and Saturation points, Transistor Amplifier. (6 Hrs)

Module-IV: Field Effect Transistors, Source, Gate and Drain, Input and Output Characteristics, MOSFET, D and E-MOSFETs. (6 Hrs)

Module-V: Familiarization with various electronic components, Analog electronic circuit designing, P-N junction diode, Zener diode and LED circuits, Measurement of Input and Output characteristics, BJT circuit design, Input and Output measurements of CB, CE and CC mode transistors, MOSFET circuit design and measurements. (8 Hrs)

#### **Course Objective**

Studies of various semiconductor devices like diodes, transistors (BJT & MOSFET) and electronic components like IC, Op-Amps. Applications of different electronic devices. Hands on training to set up electronic circuits. Testing properties and working procedures of electronic circuits.

#### **Expected Outcome**

This add-on course will help students/participants to develop their theoretical as well as practical understanding of electronic components like diode, JFET, MOSFET, Op-Amp, IC and other semiconductor circuits.

➤ Any student having interest in electronics can participate.



To  
The Principal  
Panchakot Mahavidyalaya  
Sarbari, Neturia, Purulia

Applicant: Dr. Jayanta Das, Department of Physics

Subject: Proposal for 'Certificate Course on Semiconductor Devices' for the session 2021-2022

Respected Sir,

I am requesting you please see my course details which I am going to offer to the college students in the session 2021-2022. The title of the course is 'Semiconductor Devices' in the Department of Physics at our college. This add-on course will help students/participants to develop their theoretical as well as practical understanding of electronic components like diode, JFET, MOSFET, Op-Amp, IC and other semiconductor circuits.

I request that you please kindly sanction the mentioned course.

Date: 28.04.2022

Place: Sarbari

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: (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: Physics

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

- I. Name of the course: Certificate Course on Semiconductor Devices
- II. Target participants: Undergraduate students from any stream
- III. Duration of the course: 34 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	Chandrajit 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 Semiconductor Devices

#### Syllabus (2021-2022)

**Duration:** 34 hrs

**Module-I:** Metal, Conductor, Insulator and Semiconductor. Structures, Charge Carriers, Electrons and Holes, Mobility, Electrical and thermal conductivity. Temperature dependence. (6 Hrs)

**Module-II:** Doping of semiconductors, p and n-type doping, P-N junctions, Diodes, Various types of diodes: Zener diode, Schottkey diode, Tunnel diode, Light Emitting Diode (LED). (8 Hrs)

**Module-III:** Bipolar Junction Transistors, P-N-P and N-P-N transistors, Transistor Biasing, Common Base (CB), Common Emitter (CE), Common Collector (CC) mode, Input-Output Characteristics, Cut-off and Saturation points, Transistor Amplifier. (6 Hrs)

**Module-IV:** Field Effect Transistors, Source, Gate and Drain, Input and Output Characteristics, MOSFET, D and E-MOSFETs. (6 Hrs)

**Module-V:** Familiarization with various electronic components, Analog electronic circuit designing, P-N junction diode, Zener diode and LED circuits, Measurement of Input and Output characteristics, BJT circuit design, Input and Output measurements of CB, CE and CC mode transistors, MOSFET circuit design and measurements. (8 Hrs)

**Assessment:** Written Test and/or Viva-Voce



Signature  
Course Coordinator



# PANCHAKOT MAHAVIDYALAYA

## SARBARI, NETURIA, PURULIA

Affiliated to SidhoKanho Birsha University, Purulia

### Department of Physics

#### Certificate Course on Semiconductor Devices

Session: (2021-2022)

**Course coordinator:** Dr. Jayanta Das, HOD, Physics

#### Details of the Course

**Course Objective:** Studies of various semiconductor devices like diodes, transistors (BJT & MOSFET) and electronic components like IC, Op-Amps. Applications of different electronic devices. Hands on training to set up electronic circuits. Testing properties and working procedures of electronic circuits.

#### Schedule

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



10	02	4:00-6:00 PM	CPS	Dept of Physics	Module III
11	02	4:00-6:00 PM	JD	Dept of Physics	Module IV
12	02	4:00-6:00 PM	CPS	Dept of Physics	Module IV
13	02	4:00-6:00 PM	JD	Dept of Physics	Module IV
14	02	4:00-6:00 PM	CPS	Dept of Physics	Module V
15	02	4:00-6:00 PM	JD	Dept of Physics	Module V
16	02	4:00-6:00 PM	CPS	Dept of Physics	Module V
17	02	4:00-6:00 PM	JD	Dept of Physics	Module V

**Expected Outcome:** This add-on course will help students/participants to develop their theoretical as well as practical understanding of electronic components like diode, JFET, MOSFET, Op-Amp, IC and other semiconductor circuits.



Signature  
Course Coordinator



**PANCHAKOT MAHAVIDYALAYA**  
**SARBARI, NETURIA, PURULIA**

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Department of Physics

Certificate Course on Semiconductor Devices

Session: (2021-2022)

Ref No:

Date: 4.5.2022

**Notice**


The Department of Physics, Panchakot Mahavidyalaya will conduct a certificate course on Semiconductor Devices in offline mode from 10/5/22 to 31/5/22. Interested students are encouraged to reach out to the departmental head/course coordinator for further information and enrollment details.

Details of the course module, schedule etc. and the information brochure regarding the certificate course are also available on the college website.



HOD, Department of

PhysicsPrincipal,

  
Principal  
PANCHAKOT MAHAVIDYALAYA  
Sarbari•Neturia•Purulia

Panchakot Mahavidyalaya

Sarbari, Neturia, Purulia



# PANCHAKOT MAHAVIDYALAYA

SARBARI, NETURIA, PURULIA

Affiliated to SidhoKanho Birsha University, Purulia

Department of ...PHYSICS.....


Certificate Course Name ...Semiconductor Devices.....

Session: (20.21.-20.22.)

## List of Enrolled Students

Sr. No.	Students Name	Roll Number	Semester	Student Signature
1	APARNA GORAI	210000464	Sem2	Aparna Gorai
2	SUDESHNA PAL	210000120	2	S. Pal
3	DIJUSH CHAKRABORTY	210000577	2	DiJush Chakraborty
4	KHAMA GROPE	210000495	11	Khama Grope
5	SONIYA MAJEE	210001223	11	Sonika Majee
6	IRFAN ANSARY	210000151	2	Irfan Ansary

  
Principal  
PANCHAKOT MAHAVIDYALAYA  
Sarbari • Neturia • Purulia

  
Signature  
Course Coordinator





**PANCHAKOT MAHAVIDYALAYA**  
**SARBARI, NETURIA, PURULIA**  
 Affiliated to SidhoKanho Birsha University, Purulia  
 Department of Physics  
 Certificate Course : Semi-conductor Devices

Session: (20.2.1....-20.2.2....)

**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	17
1	APARNA GORAI	P	P	P	P	P	P	P	P	P	P	P	P	.	P	P	P	P
2	SUDESHNA PAL	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
3	PIJUSH CHAKRABORTY	P	P	P	P	P	P	.	P	P	P	P	P	P	P	P	P	P
4	KHAMA GOPE	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
5	SONIYA MAJEE	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
6	IRFAN ANSARY	P	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

Affiliated to SidhoKanho Birsha University, Purulia

Department of ....*Physics*.....

Certificate Course:


.....*Semiconductor Devices*.....

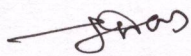
Session: (20.*21*.....-20.*22*..)

### Result

Full Marks:

Sr. No.	Name of Student	Marks Obtained
1	APARNA GORAI	A
2	SUDESHNA PAL	A
3	PIJUSH CHAKRABORTY	A
4	KHAMA GOPE	A
5	SONIYA MAJEE	A
6	IRFAN ANSARY	B

  
Principal  
PANCHAKOT MAHAVIDYALAYA  
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Signature  
Course Coordinator





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**PANCHAKOT MAHAVIDYALAYA**  
**SARBARI, NETURIA, PURULIA**  
Add On/ Certificate Course

Organized by: Department of ..... Physics .....

## CERTIFICATE OF COMPLETION

Session: (20.21..-20.22..)

This is to certify that Mr./Ms .....  
of ..... History..... Department has successfully completed Add

On/Certificate course entitled:

..... Semiconductor Devices .....

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

.....  
Course Coordinator

.....  
HOD (Organizing Dept)

.....  
Principal  
Principal  
PANCHAKOT MAHAVIDYALAYA  
Sarbari, Neturia, Purulia