

**COLLEGE OF ENGINEERING BHUBANESWAR (COEB)**  
Plot No.1 (A), CNI Complex, Patia, Bhubaneswar – 751024, Odisha, India.  
[AFFILIATED TO BPUT, ODISHA]  
[www.coeb.ac.in](http://www.coeb.ac.in)

**DEPARTMENT OF MECHANICAL ENGINEERING**

**ADD-ON COURSE: Nano Technology**  
[Programme: B.Tech, Mechanical Engg.]  
Semester: 5<sup>th</sup>

  
PRINCIPAL  
College of Engineering Bhubaneswar

**Course Objectives:**

- ❖ To understand the basics of nano technology.
- ❖ To know about the different synthesis procedures of nano materials.
- ❖ To know about the different types of characterization techniques in nano technology.

**SYLLABUS**

**Total Lecture Hours: 40**

**MODULE 1:**

**(12hours)**

Introduction: Scientific revolutions–Time and length scale in structures –Definition of a nano system –Dimensionality and size dependent phenomena –Surface to volume ratio -Fraction of surface atoms – Surface energy and surface stress –Properties at nano scale (optical, mechanical, electronic and magnetic).

Classification based on dimensionality - Quantum Dots, Wells and Wires – Carbon – based nano materials (bucky balls, nano tubes, graphene) – Metal based nano materials (nano gold, nano silver and metal oxides) – Nano composites – Nano polymers – Nano glasses – Nano ceramics – Biological nano materials.

**MODULE 2:**

**(12hours)**

Classification of synthesis: Top-down and bottom-up nanofabrication. Chemical Methods: Metal Nano crystals by Reduction – Solvo thermal Synthesis- Photochemical Synthesis – Sono chemical Routes - Chemical Vapor Deposition (CVD) – Metal Oxide – Chemical Vapor Deposition (MOCVD). Physical Methods: Ball Milling –Electrode position - Spray Pyrolysis - Flame Pyrolysis -DC/RF Magnetron Sputtering-Molecular Beam Epitaxy (MBE).

**MODULE 3:**

**(16hours)**

Characterization Techniques: Scanning Electron Microscope, Transmission Electron Microscope (TEM), Atomic force microscopy (AFM), Scanning Probe Microscope (SPM), Scanning Tunneling Microscope (STM), X-ray Diffraction (XRD).

Applications: Plasmonics - Chemical and biosensors –Nano medicine and Nano biotechnology – Nano toxicology challenges, Solar energy conversion and catalysis – Molecular electronics and printed electronics –Nano electronics - Polymers with a special architecture - Liquid crystalline systems - Linear and nonlinear optical and electro-optical properties, Applications in displays and other devices – Nano materials for data storage – Photonics.

### Course Outcomes:

After completion of course the students will be able to:

- CO1: Understand the background and the nature of the Nano Technology.
- CO2: Evaluate Nano systems, to the various fabrication techniques.
- CO3: Explain the crystal system and unit cell, reciprocal lattice and X-ray diffraction methods.
- CO4: Analyze the top-down and bottom-up approach for nano-scale device preparation.
- CO5: Discuss the nano materials and various nano measurements techniques.
- CO6: Summarize the various properties of nano composites and study mechanical properties.

### Text Books:

1. Introduction to nanotechnology by Charles P. Poole Jr. & Frank J. Owens Publisher: John Wiley & Sons (Asia) Pvt. Ltd.
2. Norio Taniguchi, Nano Technology, Oxford University Press, New York, 2003
3. Bhusan, Bharat (Ed), "Springer Handbook of Nanotechnology", 2nd Edition, 2007.
4. Pradeep T., "A Text book of Nanoscience and Nanotechnology", Tata Mc Graw Hill Education Pvt. Ltd., 2012.

### Reference Text Book:

1. Hari Singh Nalwa, "Nanostructured Materials and Nanotechnology", Academic Press, 2002.
2. Tai – Ran Hsu, MEMS and Microsystems Design and Manufacture, Tata-McGraw Hill, New Delhi, 2002.
3. Waqar Ahmed and Mark J. Jackson, Emerging Nanotechnologies for Manufacturing, Elsevier Inc., 2013, ISBN: 978-93-82291-39-8
4. Julian W. Hardner Micro Sensors, Principles and Applications, CRC Press 1993.


### Online resources:


NPTEL COURSE named "Nano-Technology, Science and Applications". Link:  
<https://www.youtube.com/watch?v=0EWCqCIsFO&list=PLyqSpQzTE6M8682dGkNTN8936vSY4Cbq>

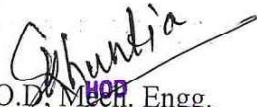
### Evaluation Criteria

- Mandatory attendance of 75% for each student.
- Conduction of two internal assessments and students have to secure 50% marks in each assessment.
- Certificates will be awarded to each student fulfilling the above criteria.

Designed & developed by: Prof (Dr.) Sujit Kumar Khuntia & Prof (Dr.) Subhakanta Nayak

  
Principal  
PRINCIPAL  
College of Engineering Bhubaneswar

  
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College of Engineering Bhubaneswar

  
H.O.D. M.ECH. Engg.  
Mechanical Engineering  
College of Engineering Bhubaneswar





# COLLEGE OF ENGINEERING BHUBANESWAR

Plot No.1 (A), CNI Complex, Patia, Bhubaneswar – 751024, Odisha, India.

## NOTICE

Department of Mechanical Engineering  
Add On Course 2022-2023

Ref No: COEB/ME/2022/19

Date: 01.10.2022

It is hereby informed to all the students that the Department of Automobile Engineering is going to start the following Add-on courses for Academic year 2022-2023. All the students are instructed to enroll their names for the following courses on or before **15.10.2022**. The classes will be commenced from **17/10/2022** during 5.30pm to 7.30pm. You can contact the following course co-ordinators for enrolment and any queries.

Sl No.	Name of Add-on Course	Sem	Duration in hours	Name of the course co-ordinators
1	Designing Components Using Solid Works	3 <sup>rd</sup>	40	Prof. Pilli Kumari Sahoo
2	Nano Technology	5 <sup>th</sup>	40	Prof (Dr.) Shanta Mohapatra
3	Introduction to 3D Printing	7 <sup>th</sup>	40	Prof. Asis Kumar Nayak

*Shanta Mohapatra*  
HOD  
Mechanical Engineering Department  
College of Engineering Bhubaneswar

Copy to:

1. Vice Chairman
2. Executive Director
3. Principal
4. All Notice Board.
5. A.O(Admin)
6. All HODs
7. Hostel, Security

*A. B. Singh*  
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# COLLEGE OF ENGINEERING BHUBANESWAR (COEB)

DEPARTMENT OF MECHANICAL ENGINEERING  
ADD ON/CERTIFICATE COURSE  
STUDENT ENROLLMENT SHEET

Programme: B Tech in MECHANICAL ENGINEERING	Academic Year : 2022-23
Semester: 5 <sup>th</sup>	Course Code (if any):
Name of the Course: Nano Technology	

I do hereby undertake to participate in the above mentioned add on course.

Sl No.	Reg. No.	Name of the Students	Signature
1	2001219017	LIZU BEHERA	Lizu Behera
2	2001219085	ABHIJIT PRADHAN	Abhijit Pradhan
3	2001219086	ARBIND TURI	Arbind Turi
4	2001219087	JYOTI RANJAN MANGARAJ	Jyoti Ranjan Mangaraj
5	2001219088	LALATENDU PRADHAN	Lalatendu Pradhan
6	2001219089	NIHAR RANJAN KUANR	Nihar Ranjan Kuanr
7	2001219256	AJAYA KUMAR MAJHI	Ajay ku. Majhi
8	2001219257	AJAYA TAMSOY	Ajay tamsoy
9	2001219258	ANANTA CHARAN MURMU	A.C. MURMU
10	2001219259	ASISH KUMAR DAS	Asish Das
11	2001219260	BALARAM GOUDA	Balaram Gouda
12	2001219261	BIRASINGH JAMUDA	Birasish Jamuda
13	2001219262	MALAYA MOHAN SWAIN	Malaya M. Swain
14	2001219263	PRAKASH SAMANTARAY	Prakash Samantaray
15	2001219264	PUSPARAJ MATI	Pusparaj Mati
16	2001219265	RANJIT KUMAR SETHI	Ranjit kumar sethi
17	2001219266	RASIKANTA DIGAL	Rasikanta Digal
18	2001219267	RITESH KUMAR SWAIN	Ritesh ku. Swain
19	2001219268	SACHINANDAN PAL	Sachinandan Pal
20	2001219269	SAGAR MOHALIK	Sagar Mohalik
21	2001219270	SAMBIT KUMAR PADHAN	Sambit Padhan
22	2001219271	SHIBRAJ SAHU	Shibray Sahu
23	2001219272	SHUBHAM KUMAR NAYAK	Shubham ku. Nayak
24	2001219273	SIBAPRASAD DAS	Sibaprasad Das
25	2001219274	SOUMYENDRA NARAYAN	soumyendra Narayan
26	2001219275	SUBRAT CHANDRA NAIK	Subrat chandra Naik
27	2001219276	SUMANTA KUMAR SAHOO	Sumanta Kumar Sahoo
28	2001219277	SWARUP DARSHI PARIDA	Swarup Darshi Parida
29	2001219278	ADITYA KUMAR MOHANTA	Aditya ku. Mohanta
30	2001219279	ASISH BEHERA	Asish Behera



*K. Bhuj*

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ADD ON/CERTIFICATE COURSE  
STUDENT ENROLLMENT SHEET

Programme: B Tech in MECHANICAL ENGINEERING Academic Year : 2022-23  
Semester: 5<sup>th</sup> Course Code (if any): Course Duration: 40 hours  
Name of the Course: Nano Technology

I do hereby undertake to participate in the above mentioned add on course.

Sl No.	Reg. No.	Name of the Students	Signature
31	2001219280	BHARAT ROHIDAS	Bharat Rohidas
32	2001219281	BIBEK MUNDA	Bibek munda
33	2001219282	DAYASAGAR LUGUN	D. Lugun
34	2001219283	DILLIP KUMAR SETHI	Dileep Kumar Sethi
35	2001219284	MD ISRAEL	Md Israel
36	2001219285	MRUTYUNJAYA SAHU	Mrutyunjay Sahu
37	2001219286	NARESH KUMAR SAHU	Narash Ku. Sahu
38	2001219287	PRIYANKA SAHOO	priyanka saho
39	2001219288	RANJIT KUMAR MISHRA	Ranjit Kumar Mishra
40	2001219289	SAMIR SAHOO	Samir Sahoo
41	2001219290	SAMIR SETHI	Samir Sethi
42	2001219291	SANJAY BHUE	sanjay Bhue
43	2001219292	SARAT KUMAR SAHOO	Sarat Sahoo
44	2001219293	SOUBHAGYA PARIDA	soubhagya parida
45	2001219294	SOUMYA KANTA DASH	Soumya kanta Dash
46	2001219295	SOURAV KUMAR PUROHIT	Sourav Ku. Purohit
47	2001219296	SURAJ BEHERA	Suraj Behera



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*A. B. Singh*

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DEPARTMENT OF MECHANICAL ENGINEERING  
ADD ON/CERTIFICATE COURSE  
STUDENT ATTENDANCE SHEET

(1)

Programme: B Tech in MECHANICAL ENGINEERING

Semester: 5<sup>th</sup>  
Academic Year : 2022-23  
Course Code (if any):

Name of the Course: Nano Technology		Sheet No:	
SI No.	Reg. No.	Name of the Students	Date
1	2001219017	LIZU BEHERA	17/10/22
2	2001219085	ABHIJIT PRADHAN	19/10/22
3	2001219086	ARBIND TURI	19/10/22
4	2001219087	JYOTI RANJAN MANGARAJ	19/10/22
5	2001219088	LALATENDU PRADHAN	19/10/22
6	2001219089	NIHAR RANJAN KUARN	19/10/22
7	2001219256	AJAYA KUMAR MAJHI	19/10/22
8	2001219257	AJAYA TAMSOY	19/10/22
9	2001219258	ANANTA CHARAN MURMU	19/10/22
10	2001219259	ASISH KUMAR DAS	19/10/22
11	2001219260	BALARAM GOUDA	19/10/22
12	2001219261	BIRASINGH JAMUDA	19/10/22
13	2001219262	MALAYA MOHAN SWAIN	19/10/22
14	2001219263	PRAKASH SAMANTARAY	19/10/22
15	2001219264	PUSPARAJ MATHI	19/10/22
16	2001219265	RANJIT KUMAR SETHI	19/10/22
17	2001219266	RASIKANTA DIGAL	19/10/22
18	2001219267	RITESH KUMAR SWAIN	19/10/22
19	2001219268	SACHINANDAN PAL	19/10/22
20	2001219269	SAGAR MOHALIK	19/10/22
21	2001219270	SAMBIT KUMAR PADHAN	19/10/22
22	2001219271	SHIBRAJ SAHU	19/10/22
23	2001219272	SHUBHAM KUMAR NAYAK	19/10/22
24	2001219273	SIBAPRASAD DAS	19/10/22
25	2001219274	SOUAMYENDRA NARAYAN	19/10/22
26	2001219275	SUBRAT CHANDRA NAIK	19/10/22
27	2001219276	SUMANTA KUMAR SAHOO	19/10/22







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Programme: B Tech in MECHANICAL ENGINEERING

Semester: 5<sup>th</sup>

Academic Year : 2022-23

Course Code (if any):

Name of the Course: Nano Technology		Sheet No:	
Sl No.	Reg. No.	Name of the Students	Date
28	2001219277	SWARUP DARSHI PARIDA	
29	2001219278	ADITYA KUMAR MOHANTA	
30	2001219279	ASISH BEHERA	
31	2001219280	BHARAT ROHIDAS	
32	2001219281	BIBEK MUNDA	
33	2001219282	DAYASAGAR LUGUN	
34	2001219283	DILLIP KUMAR SETHI	
35	2001219284	MD ISRAEL	
36	2001219285	MRUTYUNJAYA SAHU	
37	2001219286	NARESH KUMAR SAHU	
38	2001219287	PRIYANKA SAHOO	
39	2001219288	RANJIT KUMAR MISHRA	
40	2001219289	SAMIR SAHOO	
41	2001219290	SAMIR SETHI	
42	2001219291	SANJAY BHUE	
43	2001219292	SARAT KUMAR SAHOO	
44	2001219293	SOUBHAGYA PARIDA	
45	2001219294	SOUMYA KANTA DASH	
46	2001219295	SOURAV KUMAR PUROHIT	
47	2001219296	SURAJ BEHERA	



*(Signature)*

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(2)

Programme: B Tech in MECHANICAL ENGINEERING

Semester: 5<sup>th</sup>

Academic Year : 2022-23

Course Code (if any):

Name of the Course: Nano Technology		Sheet No:	
Sl No.	Reg. No.	Name of the Students	Date
1	2001219017	LIZU BEHERA	26/10/22
2	2001219085	ABHIJIT PRADHAN	27/10/22
3	2001219086	ARBIND TURI	28/10/22
4	2001219087	JYOTI RANJAN MANGARAJ	Abs
5	2001219088	LALATENDU PRADHAN	19/01/23
6	2001219089	NIHAR RANJAN KUANR	Abs
7	2001219256	AJAYA KUMAR MAJHI	Ajay ku. Majhi
8	2001219257	AJAYA TAMSOY	Ajay tamsoy
9	2001219258	ANANTA CHARAN MURMU	A.N MURMU
10	2001219259	ASISH KUMAR DAS	Asish Das
11	2001219260	BALARAM GOUDA	Balaram Gouda
12	2001219261	BIRASINGH JAMUDA	Birasigh Jamuda
13	2001219262	MALAYA MOHAN SWAIN	Melaya M. Swain
14	2001219263	PRAKASH SAMANTARAY	Prakash Samantary
15	2001219264	PUSPARAJ MATI	Pusparaj Mati
16	2001219265	RANJIT KUMAR SETHI	Ranjit Kumar sethi
17	2001219266	RASIKANTA DIGAL	Rasikanta Digal
18	2001219267	RITESH KUMAR SWAIN	Ritesh ku. Swai
19	2001219268	SACHINANDAN PAL	Sachinandan Pal
20	2001219269	SAGAR MOHALIK	Sagar Mohalik
21	2001219270	SAMBIT KUMAR PADHAN	Sambit Pradhan
22	2001219271	SHIBRAJ SAHU	Shibraj Sahu
23	2001219272	SHUBHAM KUMAR NAYAK	Shubham ku. Nayak
24	2001219273	SIBAPRASAD DAS	S. Das
25	2001219274	SOUMYENDRA NARAYAN	S. Narayan
26	2001219275	SUBRAT CHANDRA NAIK	Subrat Chandranai
27	2001219276	SUMANTA KUMAR SAHOO	Sumanta Sahu







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Programme: B Tech in MECHANICAL ENGINEERING

Semester: 5<sup>th</sup>  
Academic Year : 2022-23

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Sl No.	Reg. No.	Name of the Students	Date	Date
28	2001219277	SWARUP DARSHI PARIDA		
29	2001219278	ADITYA KUMAR MOHANTA	Swarup D. Parida	Swarup D. Parida
30	2001219279	ASISH BEHERA	Aditya Kumar Mohanta	Aditya Kumar Mohanta
31	2001219280	BHARAT ROHIDAS	Ashish Behera	Ashish Behera
32	2001219281	BIBEK MUNDA	Bharat Rohidas	Bharat Rohidas
33	2001219282	DAYASAGAR LUGUN	Bibek munda	Bibek munda
34	2001219283	DILLIP KUMAR SETHI	D. Lugun	D. Lugun
35	2001219284	MD ISRAEL	Dillip kum sethi	Dillip kum sethi
36	2001219285	MRUTYUNJAYA SAHU	MD ISRAEL	MD ISRAEL
37	2001219286	NARESH KUMAR SAHU	Murthyunjaya Sahu	Murthyunjaya Sahu
38	2001219287	PRIYANKA SAHOO	Naresh K. Sahu	Naresh K. Sahu
39	2001219288	RANJIT KUMAR MISHRA	Priyanka Sahoo	Priyanka Sahoo
40	2001219289	SAMIR SAHOO	Ranjit Mishra	Ranjit Mishra
41	2001219290	SAMIR SETHI	Samir Saha	Samir Saha
42	2001219291	SANJAY BHUE	Samir seth	Samir seth
43	2001219292	SARAT KUMAR SAHOO	Sanjay Bhue	Sanjay Bhue
44	2001219293	SOUBHAGYA PARIDA	Sarat Sahoo	Sarat Sahoo
45	2001219294	SOUMYA KANTA DASH	S. Parida	S. Parida
46	2001219295	SOURAV KUMAR PUROHIT	Soumya Kanta Dash	Soumya Kanta Dash
47	2001219296	SURAJ BEHERA	Sourav K. Purohit	Sourav K. Purohit



*(Signature)*

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Programme: B Tech in MECHANICAL ENGINEERING  
Semester: 5<sup>th</sup>  
Academic Year : 2022-23  
Course Code (if any):

Name of the Course: Nano Technology		Sheet No:	
Sl No.	Reg. No.	Name of the Students	Date
1	2001219017	LIZU BEHERA	02/11/22
2	2001219085	ABHIJIT PRADHAN	02/11/22
3	2001219086	ARBIND TURI	Abs
4	2001219087	JYOTI RANJAN MANGARAJ	Abs
5	2001219088	LALATENDU PRADHAN	02/11/22
6	2001219089	NIHAR RANJAN KUANR	02/11/22
7	2001219256	AJAYA KUMAR MAJHI	Abs
8	2001219257	AJAYA TAMSOY	Abs
9	2001219258	ANANTA CHARAN MURMU	Abs
10	2001219259	ASISH KUMAR DAS	Abs
11	2001219260	BALARAM GOUDA	Abs
12	2001219261	BIRASINGH JAMUDA	Abs
13	2001219262	MALAYA MOHAN SWAIN	Abs
14	2001219263	PRAKASH SAMANTARAY	Abs
15	2001219264	PUSPARAJ MATI	Abs
16	2001219265	RANJIT KUMAR SETHI	Abs
17	2001219266	RASIKANTA DIGAL	Abs
18	2001219267	RITESH KUMAR SWAIN	Abs
19	2001219268	SACHINANDAN PAL	Abs
20	2001219269	SAGAR MOHALIK	Abs
21	2001219270	SAMBIT KUMAR PADHAN	Abs
22	2001219271	SHIBRAJ SAHU	Abs
23	2001219272	SHUBHAM KUMAR NAYAK	Abs
24	2001219273	SIBAPRASAD DAS	Abs
25	2001219274	SOUMYENDRA NARAYAN	Abs
26	2001219275	SUBRAT CHANDRA NAIK	Abs
27	2001219276	SUMANTA KUMAR SAHOO	Abs







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Programme: B Tech in MECHANICAL ENGINEERING		Semester: 5 <sup>th</sup>		Academic Year : 2022-23		Course Code (if any):		Sheet No:	
Sl No.	Reg. No.	Name of the Students	Date	Date	Date	Date	Date	Date	Date
28	2001219277	SWARUP DARSHI PARIDA							
29	2001219278	ADITYA KUMAR MOHANTA	Shourup D. Parida	Shourup D. Parida	Shourup D. Parida	Shourup D. Parida	Shourup D. Parida	Shourup D. Parida	Shourup D. Parida
30	2001219279	ASISH BEHERA	Aditya Ku Mohanta	Aditya Ku Mohanta	Aditya Ku Mohanta	Aditya Ku Mohanta	Aditya Ku Mohanta	Aditya Ku Mohanta	Aditya Ku Mohanta
31	2001219280	BHARAT ROHIDAS	Asish Behera	Asish Behera	Asish Behera	Asish Behera	Asish Behera	Asish Behera	Asish Behera
32	2001219281	BIBEK MUNDA	Abs	Abs	Abs	Abs	Abs	Abs	Abs
33	2001219282	DAYASAGAR LUGUN	Bharat Rohidas	Bharat Rohidas	Bharat Rohidas	Bharat Rohidas	Bharat Rohidas	Bharat Rohidas	Bharat Rohidas
34	2001219283	DILLIP KUMAR SETHI	Bibek munda	Bibek munda	Bibek munda	Bibek munda	Bibek munda	Bibek munda	Bibek munda
35	2001219284	MD ISRAEL	D. Lugun	D. Lugun	D. Lugun	D. Lugun	D. Lugun	D. Lugun	D. Lugun
36	2001219285	MRUTYUNJAYA SAHU	Dillip K Seta	Dillip K Seta	Dillip K Seta	Dillip K Seta	Dillip K Seta	Dillip K Seta	Dillip K Seta
37	2001219286	NARESH KUMAR SAHU	MD ISRAEL	MD ISRAEL	MD ISRAEL	MD ISRAEL	MD ISRAEL	MD ISRAEL	MD ISRAEL
38	2001219287	PRIYANKA SAHOO	Mrutyunjay Sahu	Mrutyunjay Sahu	Mrutyunjay Sahu	Mrutyunjay Sahu	Mrutyunjay Sahu	Mrutyunjay Sahu	Mrutyunjay Sahu
39	2001219288	RANJIT KUMAR MISHRA	Naresh Ku. Sahu	Naresh Ku. Sahu	Naresh Ku. Sahu	Naresh Ku. Sahu	Naresh Ku. Sahu	Naresh Ku. Sahu	Naresh Ku. Sahu
40	2001219289	SAMIR SAHOO	Priyanka saho	Priyanka saho	Priyanka saho	Priyanka saho	Priyanka saho	Priyanka saho	Priyanka saho
41	2001219290	SAMIR SETHI	Ranjit Mishra	Ranjit Mishra	Ranjit Mishra	Ranjit Mishra	Ranjit Mishra	Ranjit Mishra	Ranjit Mishra
42	2001219291	SANJAY BHUE	Abs	Abs	Abs	Abs	Abs	Abs	Abs
43	2001219292	SARAT KUMAR SAHOO	Samir Sahu	Samir Sahu	Samir Sahu	Samir Sahu	Samir Sahu	Samir Sahu	Samir Sahu
44	2001219293	SOUBHAGYA PARIDA	Samir seth	Samir seth	Samir seth	Samir seth	Samir seth	Samir seth	Samir seth
45	2001219294	SOUMYA KANTA DASH	Sanjay Bhue	Sanjay Bhue	Sanjay Bhue	Sanjay Bhue	Sanjay Bhue	Sanjay Bhue	Sanjay Bhue
46	2001219295	SOURAV KUMAR PUROHIT	Sarat Sahoo	Sarat Sahoo	Sarat Sahoo	Sarat Sahoo	Sarat Sahoo	Sarat Sahoo	Sarat Sahoo
47	2001219296	SURAJ BEHERA	S. Parida	S. Parida	S. Parida	S. Parida	S. Parida	S. Parida	S. Parida
			Soubhaganta Dash	Soubhaganta Dash	Soubhaganta Dash	Soubhaganta Dash	Soubhaganta Dash	Soubhaganta Dash	Soubhaganta Dash
			Sourav Ku. Purohit	Sourav Ku. Purohit	Sourav Ku. Purohit	Sourav Ku. Purohit	Sourav Ku. Purohit	Sourav Ku. Purohit	Sourav Ku. Purohit
			Suraj Behera	Suraj Behera	Suraj Behera	Suraj Behera	Suraj Behera	Suraj Behera	Suraj Behera



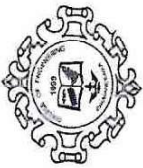
*(Signature)*

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*J. B. Singh*

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COLLEGE OF ENGINEERING BHUBANESWAR (COEB)

DEPARTMENT OF MECHANICAL ENGINEERING  
ADD ON/CERTIFICATE COURSE  
STUDENT ATTENDANCE SHEET

Programme: B Tech in MECHANICAL ENGINEERING

Semester: 5<sup>th</sup>

Academic Year: 2022-23

Course Code (if any):

Sheet No:

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Name of the Course: Nano Technology		Date		Date		Date	
Sl No.	Reg. No.	Name of the Students	Date	Date	Date	Date	Date
1	2001219017	LIZU BEHERA	04/11/22	09/11/22	10/11/22	11/11/22	11/11/22
2	2001219085	ABHIJIT PRADHAN	Lizum Behera	Lizum Behera	Lizum Behera	Lizum Behera	Lizum Behera
3	2001219086	ARBIND TURI	Abhijit Pradhan	Abhijit Pradhan	Abhijit Pradhan	Abhijit Pradhan	Abhijit Pradhan
4	2001219087	JYOTI RANJAN MANGARAJ	Anshwela Turi	Anshwela Turi	Anshwela Turi	Anshwela Turi	Anshwela Turi
5	2001219088	LALATENDU PRADHAN	Jyoti R. Mangaraj	Jyoti R. Mangaraj	Jyoti R. Mangaraj	Jyoti R. Mangaraj	Jyoti R. Mangaraj
6	2001219089	NIHAR RANJAN KUANR	Lalatendu Pradhan	Lalatendu Pradhan	Lalatendu Pradhan	Lalatendu Pradhan	Lalatendu Pradhan
7	2001219256	AJAYA KUMAR MAJHI	Nihar R. Kuanr	Nihar R. Kuanr	Nihar R. Kuanr	Nihar R. Kuanr	Nihar R. Kuanr
8	2001219257	AJAYA TAMSOY	Ajay Ku. Majhi	Ajay Ku. Majhi	Ajay Ku. Majhi	Ajay Ku. Majhi	Ajay Ku. Majhi
9	2001219258	ANANTA CHARAN MURMU	Ajaya Tamsoy	Ajaya Tamsoy	Ajaya Tamsoy	Ajaya Tamsoy	Ajaya Tamsoy
10	2001219259	ASISH KUMAR DAS	A.C. MURMU	A.C. MURMU	A.C. MURMU	A.C. MURMU	A.C. MURMU
11	2001219260	BALARAM GOUDA	Ashish Das	Ashish Das	Ashish Das	Ashish Das	Ashish Das
12	2001219261	BIRASINGH JAMUDA	Balaram Gouda	Balaram Gouda	Balaram Gouda	Balaram Gouda	Balaram Gouda
13	2001219262	MALAYA MOHAN SWAIN	Birasigh Jamuda	Birasigh Jamuda	Birasigh Jamuda	Birasigh Jamuda	Birasigh Jamuda
14	2001219263	PRAKASH SAMANTARAY	Malaya M. Swain	Malaya M. Swain	Malaya M. Swain	Malaya M. Swain	Malaya M. Swain
15	2001219264	PUSPARAJ MATI	Prakash Samantaray	Prakash Samantaray	Prakash Samantaray	Prakash Samantaray	Prakash Samantaray
16	2001219265	RANJIT KUMAR SETHI	Pusparaj Mati	Pusparaj Mati	Pusparaj Mati	Pusparaj Mati	Pusparaj Mati
17	2001219266	RASIKANTA DIGAL	Ranjit Kumar Sethi	Ranjit Kumar Sethi	Ranjit Kumar Sethi	Ranjit Kumar Sethi	Ranjit Kumar Sethi
18	2001219267	RITESH KUMAR SWAIN	Rasikanta Digal	Rasikanta Digal	Rasikanta Digal	Rasikanta Digal	Rasikanta Digal
19	2001219268	SACHINANDAN PAL	Ritesh Ku. Swain	Ritesh Ku. Swain	Ritesh Ku. Swain	Ritesh Ku. Swain	Ritesh Ku. Swain
20	2001219269	SAGAR MOHALIK	Sachinandan Pal	Sachinandan Pal	Sachinandan Pal	Sachinandan Pal	Sachinandan Pal
21	2001219270	SAMBIT KUMAR PADHAN	Sagar Mohalik	Sagar Mohalik	Sagar Mohalik	Sagar Mohalik	Sagar Mohalik
22	2001219271	SHIBRAJ SAHU	Sambit Pradhan	Sambit Pradhan	Sambit Pradhan	Sambit Pradhan	Sambit Pradhan
23	2001219272	SHUBHAM KUMAR NAYAK	Shibraj Sahu	Shibraj Sahu	Shibraj Sahu	Shibraj Sahu	Shibraj Sahu
24	2001219273	SIBAPRASAD DAS	Shubham Ku. Nayak	Shubham Ku. Nayak	Shubham Ku. Nayak	Shubham Ku. Nayak	Shubham Ku. Nayak
25	2001219274	SOUAMYENDRA NARAYAN	S. Das	S. Das	S. Das	S. Das	S. Das
26	2001219275	SUBRAT CHANDRA NAIK	S. Narayan	S. Narayan	S. Narayan	S. Narayan	S. Narayan
27	2001219276	SUMANTA KUMAR SAHOO	Subrat Chandra Naik	Subrat Chandra Naik	Subrat Chandra Naik	Subrat Chandra Naik	Subrat Chandra Naik
			Sumanta Sahoo	Sumanta Sahoo	Sumanta Sahoo	Sumanta Sahoo	Sumanta Sahoo







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ADD ON/CERTIFICATE COURSE  
STUDENT ATTENDANCE SHEET

Programme: B Tech in MECHANICAL ENGINEERING		Semester: 5 <sup>th</sup>		Academic Year : 2022-23		Course Code (if any):		Sheet No:	
SI No.	Reg. No.	Name of the Students	Date	Date	Date	Date	Date	Date	Date
28	2001219277	SWARUP DARSHI PARIDA							
29	2001219278	ADITYA KUMAR MOHANTA	Sourav D. Parida	Sourav D. Parida	Sourav D. Parida	Sourav D. Parida	Sourav D. Parida	Sourav D. Parida	Sourav D. Parida
30	2001219279	ASISH BEHERA	Aditya Ku. Mohanta	Aditya Ku. Mohanta	Aditya Ku. Mohanta	Aditya Ku. Mohanta	Aditya Ku. Mohanta	Aditya Ku. Mohanta	Aditya Ku. Mohanta
31	2001219280	BHARAT ROHIDAS	Ashish Behera	Ashish Behera	Ashish Behera	Ashish Behera	Ashish Behera	Ashish Behera	Ashish Behera
32	2001219281	BIBEK MUNDA	Bharat Rohidas	Bharat Rohidas	Bharat Rohidas	Bharat Rohidas	Bharat Rohidas	Bharat Rohidas	Bharat Rohidas
33	2001219282	DAYASAGAR LUGUN	Bibek munda	Bibek munda	Bibek munda	Bibek munda	Bibek munda	Bibek munda	Bibek munda
34	2001219283	DILLIP KUMAR SETHI	D. Lugun	D. Lugun	D. Lugun	D. Lugun	D. Lugun	D. Lugun	D. Lugun
35	2001219284	MD ISRAEL	Dillip K. Sethi	Dillip K. Sethi	Dillip K. Sethi	Dillip K. Sethi	Dillip K. Sethi	Dillip K. Sethi	Dillip K. Sethi
36	2001219285	MRUTYUNJAYA SAHU	MD Israel	MD Israel	MD Israel	MD Israel	MD Israel	MD Israel	MD Israel
37	2001219286	NARESH KUMAR SAHU	Mrutyunjay Sahu	Mrutyunjay Sahu	Mrutyunjay Sahu	Mrutyunjay Sahu	Mrutyunjay Sahu	Mrutyunjay Sahu	Mrutyunjay Sahu
38	2001219287	PRIYANKA SAHOO	Naresh Ku. Sahu	Naresh Ku. Sahu	Naresh Ku. Sahu	Naresh Ku. Sahu	Naresh Ku. Sahu	Naresh Ku. Sahu	Naresh Ku. Sahu
39	2001219288	RANJIT KUMAR MISHRA	Priyanka Sahoo	Priyanka Sahoo	Priyanka Sahoo	Priyanka Sahoo	Priyanka Sahoo	Priyanka Sahoo	Priyanka Sahoo
40	2001219289	SAMIR SAHOO	Ranjit Mishra	Ranjit Mishra	Ranjit Mishra	Ranjit Mishra	Ranjit Mishra	Ranjit Mishra	Ranjit Mishra
41	2001219290	SAMIR SETH	Samir Sahoo	Samir Sahoo	Samir Sahoo	Samir Sahoo	Samir Sahoo	Samir Sahoo	Samir Sahoo
42	2001219291	SANJAY BHUE	Samir Sethi	Samir Sethi	Samir Sethi	Samir Sethi	Samir Sethi	Samir Sethi	Samir Sethi
43	2001219292	SARAT KUMAR SAHOO	Sanjay Bhue	Sanjay Bhue	Sanjay Bhue	Sanjay Bhue	Sanjay Bhue	Sanjay Bhue	Sanjay Bhue
44	2001219293	SOUBHAGYA PARIDA	Sarat Sahoo	Sarat Sahoo	Sarat Sahoo	Sarat Sahoo	Sarat Sahoo	Sarat Sahoo	Sarat Sahoo
45	2001219294	SOUMYA KANTA DASH	S. parida	S. parida	S. parida	S. parida	S. parida	S. parida	S. parida
46	2001219295	SOURAV KUMAR PUROHIT	Soumyakanta Dash	Soumyakanta Dash	Soumyakanta Dash	Soumyakanta Dash	Soumyakanta Dash	Soumyakanta Dash	Soumyakanta Dash
47	2001219296	SURAJ BEHERA	Sourav Ku. Purohit	Sourav Ku. Purohit	Sourav Ku. Purohit	Sourav Ku. Purohit	Sourav Ku. Purohit	Sourav Ku. Purohit	Sourav Ku. Purohit



*S. Parida*

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Programme: B Tech in MECHANICAL ENGINEERING		Semester: 5 <sup>th</sup>		Academic Year: 2022-23		Course Code (if any):		Sheet No:	
Name of the Course: Nano Technology		Date	Date	Date	Date	Date	Date	Date	Date
Sl No.	Reg. No.	Name of the Students	Signature	Date	Signature	Date	Signature	Date	Signature
1	2001219017	LIZU BEHERA	<i>Lizu Behera</i>	17/11/22	<i>Lizu Behera</i>	18/11/22	<i>Lizu Behera</i>	21/11/22	<i>Lizu Behera</i>
2	2001219085	ABHIJIT PRADHAN	<i>Abhijit Pradhan</i>		<i>Abhijit Pradhan</i>		<i>Abhijit Pradhan</i>		<i>Abhijit Pradhan</i>
3	2001219086	ARBIND TURI	<i>Arbind Turi</i>		<i>Arbind Turi</i>		<i>Arbind Turi</i>		<i>Arbind Turi</i>
4	2001219087	JYOTI RANJAN MANGARAJ	<i>Jyoti R. Mangaraj</i>		<i>Jyoti R. Mangaraj</i>		<i>Jyoti R. Mangaraj</i>		<i>Jyoti R. Mangaraj</i>
5	2001219088	LALATENDU PRADHAN	<i>Lalatuendu Pradhan</i>		<i>Lalatuendu Pradhan</i>		<i>Lalatuendu Pradhan</i>		<i>Lalatuendu Pradhan</i>
6	2001219089	NIHAR RANJAN KUANR	<i>Nihar R. Kuanr</i>		<i>Nihar R. Kuanr</i>		<i>Nihar R. Kuanr</i>		<i>Nihar R. Kuanr</i>
7	2001219256	AJAYA KUMAR MAJHI	<i>Ajaya Kumar Majhi</i>		<i>Ajaya Kumar Majhi</i>		<i>Ajaya Kumar Majhi</i>		<i>Ajaya Kumar Majhi</i>
8	2001219257	AJAYA TAMSOY	<i>Ajaya Tamsoy</i>		<i>Ajaya Tamsoy</i>		<i>Ajaya Tamsoy</i>		<i>Ajaya Tamsoy</i>
9	2001219258	ANANTA CHARAN MURMU	<i>A.C. MURMU</i>		<i>A.C. MURMU</i>		<i>A.C. MURMU</i>		<i>A.C. MURMU</i>
10	2001219259	ASISH KUMAR DAS	<i>ASESH DAS</i>		<i>ASESH DAS</i>		<i>ASESH DAS</i>		<i>ASESH DAS</i>
11	2001219260	BALARAM GOUDA	<i>Balararam Gouda</i>		<i>Balararam Gouda</i>		<i>Balararam Gouda</i>		<i>Balararam Gouda</i>
12	2001219261	BIRASINGH JAMUDA	<i>Birasisingh Jamuda</i>		<i>Birasisingh Jamuda</i>		<i>Birasisingh Jamuda</i>		<i>Birasisingh Jamuda</i>
13	2001219262	MALAYA MOHAN SWAIN	<i>Malaya M. Swain</i>		<i>Malaya M. Swain</i>		<i>Malaya M. Swain</i>		<i>Malaya M. Swain</i>
14	2001219263	PRAKASH SAMANTARAY	<i>Prakash Samantaray</i>		<i>Prakash Samantaray</i>		<i>Prakash Samantaray</i>		<i>Prakash Samantaray</i>
15	2001219264	PUSPARAJ MATI	<i>Pusparaj Mati</i>		<i>Pusparaj Mati</i>		<i>Pusparaj Mati</i>		<i>Pusparaj Mati</i>
16	2001219265	RANJIT KUMAR SETHI	<i>Ranjit Kumar Sethi</i>		<i>Ranjit Kumar Sethi</i>		<i>Ranjit Kumar Sethi</i>		<i>Ranjit Kumar Sethi</i>
17	2001219266	RASIKANTA DIGAL	<i>Rasikanta Digal</i>		<i>Rasikanta Digal</i>		<i>Rasikanta Digal</i>		<i>Rasikanta Digal</i>
18	2001219267	RITESH KUMAR SWAIN	<i>Ritesh Kumar Swain</i>		<i>Ritesh Kumar Swain</i>		<i>Ritesh Kumar Swain</i>		<i>Ritesh Kumar Swain</i>
19	2001219268	SACHINANDAN PAL	<i>Sachinandan Pal</i>		<i>Sachinandan Pal</i>		<i>Sachinandan Pal</i>		<i>Sachinandan Pal</i>
20	2001219269	SAGAR MOHALIK	<i>Sagar Mohalik</i>		<i>Sagar Mohalik</i>		<i>Sagar Mohalik</i>		<i>Sagar Mohalik</i>
21	2001219270	SAMBIT KUMAR PADHAN	<i>Sambit Pradhan</i>		<i>Sambit Pradhan</i>		<i>Sambit Pradhan</i>		<i>Sambit Pradhan</i>
22	2001219271	SHIBRAJ SAHU	<i>Shibray Sahu</i>		<i>Shibray Sahu</i>		<i>Shibray Sahu</i>		<i>Shibray Sahu</i>
23	2001219272	SHUBHAM KUMAR NAYAK	<i>Shubham Kumar Nayak</i>		<i>Shubham Kumar Nayak</i>		<i>Shubham Kumar Nayak</i>		<i>Shubham Kumar Nayak</i>
24	2001219273	SIBAPRASAD DAS	<i>S. Das</i>		<i>S. Das</i>		<i>S. Das</i>		<i>S. Das</i>
25	2001219274	SOUAMYENDRA NARAYAN	<i>S. Narayan</i>		<i>S. Narayan</i>		<i>S. Narayan</i>		<i>S. Narayan</i>
26	2001219275	SUBRAT CHANDRA NAIK	<i>Subrat Chandran Naik</i>		<i>Subrat Chandran Naik</i>		<i>Subrat Chandran Naik</i>		<i>Subrat Chandran Naik</i>
27	2001219276	SUMANTA KUMAR SAHOO	<i>Sumanta Sahoo</i>		<i>Sumanta Sahoo</i>		<i>Sumanta Sahoo</i>		<i>Sumanta Sahoo</i>








**COLLEGE OF ENGINEERING BHUBANESWAR (COEB)**

DEPARTMENT OF MECHANICAL ENGINEERING  
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Programme: B Tech in MECHANICAL ENGINEERING		Semester: 5 <sup>th</sup>		Academic Year: 2022-23		Course Code (if any):		Sheet No:	
Sl No.	Reg. No.	Name of the Students	Date	Date	Date	Date	Date	Date	Date
28	2001219277	SWARUP DARSHI PARIDA	Sourav K. Parida	Sourav K. Parida	Sourav K. Parida	Sourav K. Parida	Sourav K. Parida	Sourav K. Parida	Sourav K. Parida
29	2001219278	ADITYA KUMAR MOHANTA	Aditya Kumar Mohanta	Aditya Kumar Mohanta	Aditya Kumar Mohanta	Aditya Kumar Mohanta	Aditya Kumar Mohanta	Aditya Kumar Mohanta	Aditya Kumar Mohanta
30	2001219279	ASISH BEHERA	Abs	Abs	Abs	Abs	Abs	Abs	Abs
31	2001219280	BHARAT ROHIDAS	Bharat Rohidas	Bharat Rohidas	Bharat Rohidas	Bharat Rohidas	Bharat Rohidas	Bharat Rohidas	Bharat Rohidas
32	2001219281	BIBEK MUNDA	Bibek Munda	Bibek Munda	Bibek Munda	Bibek Munda	Bibek Munda	Bibek Munda	Bibek Munda
33	2001219282	DAYASAGAR LUGUN	D. Lugun	D. Lugun	D. Lugun	D. Lugun	D. Lugun	D. Lugun	D. Lugun
34	2001219283	DILLIP KUMAR SETHI	D. Lugun	D. Lugun	D. Lugun	D. Lugun	D. Lugun	D. Lugun	D. Lugun
35	2001219284	MD ISRAEL	MD Israel	MD Israel	MD Israel	MD Israel	MD Israel	MD Israel	MD Israel
36	2001219285	MRUTYUNJAYA SAHU	MD Israel	MD Israel	MD Israel	MD Israel	MD Israel	MD Israel	MD Israel
37	2001219286	NARESH KUMAR SAHU	Mrunjoy Bhue	Mrunjoy Bhue	Mrunjoy Bhue	Mrunjoy Bhue	Mrunjoy Bhue	Mrunjoy Bhue	Mrunjoy Bhue
38	2001219287	PRIYANKA SAHOO	Naresh K. Sahu	Naresh K. Sahu	Naresh K. Sahu	Naresh K. Sahu	Naresh K. Sahu	Naresh K. Sahu	Naresh K. Sahu
39	2001219288	RANJIT KUMAR MISHRA	Priyanka Sahoo	Priyanka Sahoo	Priyanka Sahoo	Priyanka Sahoo	Priyanka Sahoo	Priyanka Sahoo	Priyanka Sahoo
40	2001219289	SAMIR SAHOO	Abs	Abs	Abs	Abs	Abs	Abs	Abs
41	2001219290	SAMIR SETH	Samir Sahoo	Samir Sahoo	Samir Sahoo	Samir Sahoo	Samir Sahoo	Samir Sahoo	Samir Sahoo
42	2001219291	SANJAY BHUE	Samir Seth	Samir Seth	Samir Seth	Samir Seth	Samir Seth	Samir Seth	Samir Seth
43	2001219292	SARAT KUMAR SAHOO	Sanjay Bhue	Sanjay Bhue	Sanjay Bhue	Sanjay Bhue	Sanjay Bhue	Sanjay Bhue	Sanjay Bhue
44	2001219293	SOUBHAGYA PARIDA	Sarat Sahoo	Sarat Sahoo	Sarat Sahoo	Sarat Sahoo	Sarat Sahoo	Sarat Sahoo	Sarat Sahoo
45	2001219294	SOUMYA KANTA DASH	Abs	Abs	Abs	Abs	Abs	Abs	Abs
46	2001219295	SOURAV KUMAR PUROHIT	Soumyakanta Dash	Soumyakanta Dash	Soumyakanta Dash	Soumyakanta Dash	Soumyakanta Dash	Soumyakanta Dash	Soumyakanta Dash
47	2001219296	SURAJ BEHERA	Sourav K. Purohit	Sourav K. Purohit	Sourav K. Purohit	Sourav K. Purohit	Sourav K. Purohit	Sourav K. Purohit	Sourav K. Purohit



  
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PLOT NO-1(A), CNI COMPLEX, PATIA, BHUBANESWAR, KHORDHA, ODISHA-751024



# Certificate of Completion


This is to certify that Mr./Ms. MALAYA MOHAN SWAIN, student of the Department

of Mechanical Engg. semester Fifth bearing registration number 2001219262


has successfully completed the ADD-ON Course titled Nano Technology

conducted at College of Engineering Bhubaneswar in the academic year 2022-23

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Course-Coordinator

  
Principal

  
PRINCIPAL  
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**COLLEGE OF ENGINEERING BHUBANESWAR**

PLOT NO-1(A), CNI COMPLEX, PATIA, BHUBANESWAR, KHORDHA, ODISHA-751024



# *Certificate of Completion*

This is to certify that Mr./Ms. PRAKASH SAMANTARAY, student of the Department

of Mechanical Engg. semester Fifth bearing registration number 2001219263

has successfully completed the ADD-ON Course titled Nano Technology

conducted at College of Engineering Bhubaneswar in the academic year 2022-23

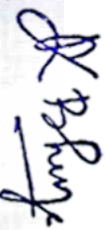
**TRUE COPY**

  
Course-Coordinator

Course-Coordinator



Principal



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**COLLEGE OF ENGINEERING BHUBANESWAR**  
 PLOT NO-1(A), CNI COMPLEX, PATIA, BHUBANESWAR, KHORDHA, ODISHA-751024



# Certificate of Completion

This is to certify that Mr./Ms. PUSPARAJ MATI, student of the Department

of Mechanical Engg. semester Fifth bearing registration number 2001219264

has successfully completed the ADD-ON Course titled Nano Technology

conducted at College of Engineering Bhubaneswar in the academic year 2022-23

*Smahapati*

Course-Coordinator

*[Signature]*

Principal

*[Signature]*

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# Certificate of Completion

This is to certify that Mr./Ms. RANJIT KUMAR SETHI student of the Department

of Mechanical Engg. semester Fifth bearing registration number 2001219265

has successfully completed the ADD-ON Course titled Nano Technology

conducted at College of Engineering Bhubaneswar in the academic year 2022-23

**TRUE COPY**

*Smohapatra*  
 Course-Coordinator

*[Signature]*  
 Principal

*[Signature]*  
 PRINCIPAL

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# Certificate of Completion

This is to certify that Mr./Ms. RASIKANTA DIGAL, student of the Department

of Mechanical Engg. semester Fifth bearing registration number 2001219266

has successfully completed the ADD-ON Course titled Nano Technology

conducted at College of Engineering Bhubaneswar in the academic year 2022-23

**TRUE COPY**

*Sumanapatri*

Course-Coordinator

*[Signature]*

Principal

*[Signature]*

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