



Shri Sarda Education Society (Trust)'s  
Smt. Radhabai Sarda Arts, Commerce & Science College,  
Anjangaon Surji. District- Amravati (Maharashtra) 444705

*NAAC Accredited 'A' with CGPA 3.21*

## **DEPARTMENT OF PHYSICS**

***Certificate Course***

***Basics of Thin Film Technology***

Session 2023-2024

Shri Sarda Education Society (Trust)'s  
Smt. Radhabai Sarda Arts, Commerce & Science College, Anjangaon Surji.  
District- Amravati (Maharashtra) 444705  
NAAC Accredited 'A' with CGPA 3.21

## DEPARTMENT OF PHYSICS

### Report

Department of Physics has conducted Certificate Course entitled "Basics of thin film technology" consisting of 30 clock hours for B.Sc. students between 1/02/2024 to 20/02/2024. Total 48 students from B.Sc. part I were enrolled and successfully completed the above course. The basics ideas about thin film technology, its synthesis and characterization and possible applications in various fields were exposed to students by theoretical and experimental methods. Finally students were evaluated through course end examination. With the successful completion of the course students acquired the described course outcomes with specific knowledge.

mm  
22/2/2024

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DEPARTMENT OF PHYSICS  
SMT. RADHABAI SARDAR COLLEGE  
ANJANGAON SURJI

  
PRINCIPAL  
Smt. Radhabai Sarda  
Arts, Commerce & Science College  
Anjangaon Surji



Shri Sarda Education Society (Trust)'s  
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**DEPARTMENT OF PHYSICS**

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Date: 2/1/2024

To,  
The Hon'ble Principal,  
Smt. Radhabai Sarda College,  
Anjangaon Surji.

Subject: Permission for introducing Certificate Course for session 2023-2024

Respected Sir,

Department of Physics in its departmental meeting has decided to introduce a certificate course '**Basics Thin Film Technology**' for the session academic session 2023-2024. The course will consist of 30 clock hour's duration including theoretical and practical work. So you are kindly requested to grant permission for the same.

Thanking you in anticipation.

Yours Faithfully,

*mm*  
2/1/24

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DEPARTMENT OF PHYSICS  
SMT. RADHABAI SARDAR COLLEGE  
ANJANGAON SURJI

*Granted*

*mm*

PRINCIPAL  
Smt. Radhabai Sarda  
Arts, Commerce & Science College  
Anjangaon Surji



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**DEPARTMENT OF PHYSICS**

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Date: 7/1/2024

**Notice**

All the students of Science Faculty are hereby informed that Department of Physics has introduced Certificate Course entitled '**Basics of Thin Film Technology**' for session 2023-2024. The course will commence from 1/02/2024 and consists of 30 clock hours. The interested students should forward their names to Shri R. B. Mankar on or before 30/01/2024.

*RM*  
*7/1/2024*  
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DEPARTMENT OF PHYSICS  
SMT. RADHABA SARDIA COLLEGE  
ANJANGAON SURJI





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## DEPARTMENT OF PHYSICS

Course	Certificate course	
Title of course	Basics of thin film technology	
Session	2023-2024	
Duration of course	30 hours	
Syllabus		
Unit I	<b>Introduction to Film technology</b> Thermodynamics and reactivity surfaces, Film formation: Nucleation, growth modes, Microstructure, Effect of substrate and growth rate	7 hours
Unit II	<b>Thin film synthesis</b> Physical Vapor Deposition techniques: Thermal evaporation, Resistive evaporation, Electron beam evaporation, Chemical Vapor Deposition techniques: Metal organic CVD (MOCVD), Plasma Enhanced CVD (PECVD), Thermally activated CVD, Spray pyrolysis	8 hours
Unit III	<b>Thin film Characterization</b> X-ray diffraction technique, UV- spectroscopy technique, FE-SEM technique, EDAX technique	8 hours
Unit IV	<b>Applications</b> Electrical and optical properties Application to Renewable energy technology Thin film solar cells	7 hours
Reference Book	1) Thin Film Materials Technology by Hideaki Adachi, Kiyotaka Wa 2) Hand book of Thin Film Technology by Hamid R Khan 3) Introduction to Nanoscience and Nanotechnology by K. K. Chattopadhyay, A.N. Banerjee	

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21/11/2024  
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DEPARTMENT OF PHYSICS  
SMT. RADHABAI SARDAR COLLEGE  
ANJANGAON SURJI



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## DEPARTMENT OF PHYSICS

Course	Certificate course	
Title of course	Basics of thin film technology	
Session	2023-2024	
Duration of course	30 hours	
Time Table and proposed plan		
Date	Time	Syllabus to be covered
1/02/2024	9.00 am – 11.00 am	Unit I
2/02/2024	9.00 am – 11.00 am	
3/02/2024	9.00 am – 11.00 am	
5/02/2024	9.00 am – 11.00 am	
6/02/2024	9.00 am – 11.00 am	Unit II
7/02/2024	9.00 am – 11.00 am	
8/02/2024	9.00 am – 11.00 am	
9/02/2024	9.00 am – 11.00 am	
10/02/2024	9.00 am – 11.00 am	Unit III
12/02/2024	9.00 am – 11.00 am	
13/02/2024	9.00 am – 11.00 am	
14/02/2024	9.00 am – 11.00 am	Unit IV
15/02/2024	9.00 am – 11.00 am	
16/02/2024	9.00 am – 11.00 am	
17/02/2024	9.00 am – 11.00 am	Examination
20/02/2024	4.00 pm	Result, certificate distribution



mm 21/12/2024  
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DEPARTMENT OF PHYSICS  
SMT. RADHABAI SARDAR COLLEGE  
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## DEPARTMENT OF PHYSICS

Course: Certificate Course Title of Course: Basics of Thin Film Technology Session: 2023-2024

S.N.	Name of Student	1/2/24	2/2/24	3/2/24	5/2/24	6/2/24	7/2/24	8/2/24	9/2/24
1	Ku. Aarti Subhash Sagane	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>A</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>A</del>
2	Ku. Adiba Anjum Mukhtar Khan	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>
3	Mr. Aditya Suresh Bundlie	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>A</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>
4	Ku. Akanksha Narandra Bhonde	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>
5	Mr. Akshay Devendra Sherkar	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>
6	Ku. Anisha Shrikrushna Kalpande	<del>A</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>
7	Mr. Anuj Shiram Datir	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>
8	Mr. Atharva Nitinrao Mankar	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>
9	Ku. Chanchal Jivan Dhule	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>
10	Ku. Damini Suresh Neware	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>
11	Mr. Dev Manoj Ghadekar	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>A</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>
12	Mr. Dipak Bhimrao More	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>A</del>
13	Ku. Divya Rambhau Gujar	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>A</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>
14	Ku. Divyani Dinesh Dhurve	<del>A</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>	<del>A</del>	<del>Agene</del>	<del>Agene</del>	<del>Agene</del>





S.N.	Name of student	11/2/24	2/2/24	3/2/24	5/2/24	6/2/24	7/2/24	8/2/24	9/2/24
15	Ku. Gauri Anil Maskare	<del>Almoskar</del>	<del>Almoskar</del>	A	A	<del>Almoskar</del>	<del>Almoskar</del>	<del>Almoskar</del>	<del>Almoskar</del>
16	Ku. Gauri Satish Kadu	Ykadi	Ykadi	Ykadi	Ykadi	Ykadi	Ykadi	Ykadi	Ykadi
17	Ku. Gayatri Bajrangsinha Rajpurohit	Gayatri	Gayatri	Gayatri	Gayatri	A	A	Gayatri	Gayatri
18	Ku. Gayatri Rajesh Yewale	<del>Gayatri</del>	<del>Gayatri</del>	<del>Gayatri</del>	<del>Gayatri</del>	<del>Gayatri</del>	<del>Gayatri</del>	<del>A</del>	<del>Gayatri</del>
19	Ku. Ishika Sachinrao Chauhande	Shankhade	Shankhade	Shankhade	Shankhade	Shankhade	Shankhade	Shankhade	Shankhade
20	Ku. Janhvi Prashant Pise	Jise	Jise	Jise	Jise	Jise	Jise	Jise	Jise
21	Mr. Karik Ganesh Singh Jarole	D	D	D	D	D	D	D	D
22	Mr. Kaushal Jitendra Tayade	<del>B</del>	<del>B</del>	<del>B</del>	<del>B</del>	<del>B</del>	<del>B</del>	<del>B</del>	<del>B</del>
23	Ku. Komal Prashant Potdukhe	<del>Pradukhe</del>	<del>Pradukhe</del>	<del>Pradukhe</del>	<del>Pradukhe</del>	<del>Pradukhe</del>	<del>Pradukhe</del>	<del>Pradukhe</del>	<del>Pradukhe</del>
24	Ku. Krutika Arunrao Arbad	Arabad	Arabad	Arabad	Arabad	Arabad	Arabad	Arabad	Arabad
25	Mr. Kuldip Ravindra Reche	<del>Reche</del>	<del>Reche</del>	<del>Reche</del>	<del>Reche</del>	<del>Reche</del>	<del>Reche</del>	<del>Reche</del>	<del>Reche</del>
26	Ku. Mahi Santosh Dhokane	Mahi	Mahi	Mahi	A	Mahi	Mahi	Mahi	Mahi
27	Mr. Nakul Divakar Tayde	<del>Nayade</del>	<del>Nayade</del>	<del>Nayade</del>	<del>Nayade</del>	<del>Nayade</del>	<del>Nayade</del>	<del>Nayade</del>	<del>Nayade</del>
28	Ku. Premna Anil Makode	<del>Prakade</del>	<del>Prakade</del>	<del>Prakade</del>	<del>Prakade</del>	<del>Prakade</del>	<del>Prakade</del>	<del>Prakade</del>	<del>Prakade</del>
29	Ku. Priyanka Siddharth Sardar	Bsarda	Bsarda	Bsarda	Bsarda	Bsarda	Bsarda	Bsarda	Bsarda
30	Ku. Ruchika Sanjaysingh Khojare	<del>Rukhore</del>	<del>Rukhore</del>	<del>Rukhore</del>	<del>Rukhore</del>	<del>Rukhore</del>	<del>Rukhore</del>	<del>Rukhore</del>	<del>Rukhore</del>
31	Ku. Rutuja Raosaheb Pakham	<del>Rukham</del>	<del>Rukham</del>	<del>Rukham</del>	<del>Rukham</del>	<del>Rukham</del>	<del>Rukham</del>	<del>Rukham</del>	<del>Rukham</del>
32	Mr. Sahil Bhashkar Shingnapure	<del>Sshingnapure</del>	<del>Sshingnapure</del>	<del>Sshingnapure</del>	<del>Sshingnapure</del>	<del>Sshingnapure</del>	<del>Sshingnapure</del>	<del>Sshingnapure</del>	<del>Sshingnapure</del>





S.N.	Name of Student	11/2/24	21/2/24	31/2/24	5/12/24	6/12/24	7/12/24	8/12/24	9/12/24
33	Ku. Sakshi Naresh Rekhate	<del>Sakshi</del>	<del>Sakshi</del>	<del>Sakshi</del>	<del>Sakshi</del>	<del>Sakshi</del>	<del>Sakshi</del>	<del>Sakshi</del>	<del>Sakshi</del>
34	Ku. Sakshi Santosh Bhongade	S.S. Bhongade	S.S. Bhongade	S.S. Bhongade	S.S. Bhongade	S.S. Bhongade	S.S. Bhongade	S.S. Bhongade	S.S. Bhongade
35	Ku. Sanika Ajabrao Ghule	<del>Rajale</del>	<del>Rajale</del>	<del>Rajale</del>	<del>Rajale</del>	<del>Rajale</del>	<del>Rajale</del>	<del>Rajale</del>	<del>Rajale</del>
36	Mr. Shantanu Sunilrao Patulkale	<del>Shant</del>	<del>Shant</del>	<del>Shant</del>	<del>Shant</del>	<del>Shant</del>	<del>Shant</del>	<del>Shant</del>	<del>Shant</del>
37	Ku. Shital Rajendra Bhawe	<del>Bhawe</del>	<del>Bhawe</del>	<del>Bhawe</del>	<del>Bhawe</del>	<del>Bhawe</del>	<del>Bhawe</del>	<del>Bhawe</del>	<del>Bhawe</del>
38	Ku. Shivani Manikar Shirole	<del>Bhivale</del>	<del>Bhivale</del>	<del>Bhivale</del>	<del>Bhivale</del>	<del>Bhivale</del>	<del>Bhivale</del>	<del>Bhivale</del>	<del>Bhivale</del>
39	Ku. Shivani Ravindra Ghule	<del>Bhule</del>	<del>Bhule</del>	<del>Bhule</del>	<del>Bhule</del>	<del>Bhule</del>	<del>Bhule</del>	<del>Bhule</del>	<del>Bhule</del>
40	Ku. Shravani R. Khalokar	<del>Shalokar</del>	<del>Shalokar</del>	A	<del>Shalokar</del>	<del>Shalokar</del>	<del>Shalokar</del>	A	<del>Shalokar</del>
41	Ku. Shrutika Rajendara Gurav	<del>Shrutika</del>	<del>Shrutika</del>	<del>Shrutika</del>	<del>Shrutika</del>	<del>Shrutika</del>	<del>Shrutika</del>	<del>Shrutika</del>	<del>Shrutika</del>
42	Ku. Switi Radheshyam Shinde	<del>Bhinde</del>	<del>Bhinde</del>	<del>Bhinde</del>	<del>Bhinde</del>	<del>Bhinde</del>	<del>Bhinde</del>	<del>Bhinde</del>	<del>Bhinde</del>
43	Ku. Tanaya Satish Kharad	<del>Shkharad</del>	<del>Shkharad</del>	<del>Shkharad</del>	<del>Shkharad</del>	<del>Shkharad</del>	<del>Shkharad</del>	<del>Shkharad</del>	<del>Shkharad</del>
44	Ku. Tanvi Ganesh Gorde	<del>Gorde</del>	<del>Gorde</del>	<del>Gorde</del>	<del>Gorde</del>	<del>Gorde</del>	<del>Gorde</del>	<del>Gorde</del>	<del>Gorde</del>
45	Ku. Tanvi Sunil Dongardive	<del>Dongardive</del>	<del>Dongardive</del>	<del>Dongardive</del>	A	<del>Dongardive</del>	<del>Dongardive</del>	A	<del>Dongardive</del>
46	Mr. Tejas Suresh Rao Jawanjale	<del>Tejas</del>	<del>Tejas</del>	<del>Tejas</del>	<del>Tejas</del>	<del>Tejas</del>	<del>Tejas</del>	<del>Tejas</del>	<del>Tejas</del>
47	Ku. Ummati Dinesh Ruchake	<del>Ruchake</del>	<del>Ruchake</del>	<del>Ruchake</del>	<del>Ruchake</del>	<del>Ruchake</del>	<del>Ruchake</del>	<del>Ruchake</del>	<del>Ruchake</del>
48	Ku. Vedika Namdev Yeul	<del>Yeul</del>	<del>Yeul</del>	<del>Yeul</del>	<del>Yeul</del>	<del>Yeul</del>	<del>Yeul</del>	<del>Yeul</del>	<del>Yeul</del>



HEAD  
DEPARTMENT OF PHYSICS  
SMITHAD, D. S.M.T.R.S. COLLEGE  
AMRANGAON SURJI



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## DEPARTMENT OF PHYSICS

Course: Certificate Course Title of Course: Basics of Thin Film Technology Session: 2023-2024

S.N.	Name of Student	16/12/24	12/12/24	13/12/24	14/12/24	15/12/24	16/12/24	17/12/24	20/12/24
1	Ku. Aarti Subhash Sagane	<u>Sagane</u>	<u>Sagane</u>	<u>Sagane</u>	<u>Sagane</u>	<u>A</u>	<u>A</u>	<u>Sagane</u>	<u>Sagane</u>
2	Ku. Adiba Anjum Mukhtar Khan	<u>Adiba</u>	<u>Adiba</u>	<u>Adiba</u>	<u>Adiba</u>	<u>Adiba</u>	<u>Adiba</u>	<u>Adiba</u>	<u>Adiba</u>
3	Mr. Aditya Suresh Bundile	<u>Aditya</u>	<u>Aditya</u>	<u>Aditya</u>	<u>Aditya</u>	<u>Aditya</u>	<u>Aditya</u>	<u>Aditya</u>	<u>Aditya</u>
4	Ku. Akanksha Narandra Bhonde	<u>Akanksha</u>	<u>Akanksha</u>	<u>Akanksha</u>	<u>Akanksha</u>	<u>Akanksha</u>	<u>Akanksha</u>	<u>Akanksha</u>	<u>Akanksha</u>
5	Mr. Akshay Devendra Sherkar	<u>Akshay</u>	<u>Akshay</u>	<u>Akshay</u>	<u>Akshay</u>	<u>Akshay</u>	<u>Akshay</u>	<u>Akshay</u>	<u>Akshay</u>
6	Ku. Anisha Shrikrushna Kalpande	<u>Anisha</u>	<u>Anisha</u>	<u>Anisha</u>	<u>Anisha</u>	<u>Anisha</u>	<u>Anisha</u>	<u>Anisha</u>	<u>Anisha</u>
7	Mr. Anuj Shiram Datir	<u>Anuj</u>	<u>Anuj</u>	<u>Anuj</u>	<u>Anuj</u>	<u>Anuj</u>	<u>Anuj</u>	<u>Anuj</u>	<u>Anuj</u>
8	Mr. Atharva Nitinrao Mankar	<u>Atharva</u>	<u>Atharva</u>	<u>Atharva</u>	<u>Atharva</u>	<u>Atharva</u>	<u>Atharva</u>	<u>Atharva</u>	<u>Atharva</u>
9	Ku. Chanchal Jivan Dhule	<u>Chanchal</u>	<u>Chanchal</u>	<u>Chanchal</u>	<u>Chanchal</u>	<u>Chanchal</u>	<u>Chanchal</u>	<u>Chanchal</u>	<u>Chanchal</u>
10	Ku. Damini Suresh Neware	<u>Damini</u>	<u>Damini</u>	<u>Damini</u>	<u>Damini</u>	<u>Damini</u>	<u>Damini</u>	<u>Damini</u>	<u>Damini</u>
11	Mr. Dev Manoj Ghadekar	<u>Dev</u>	<u>Dev</u>	<u>Dev</u>	<u>Dev</u>	<u>Dev</u>	<u>Dev</u>	<u>Dev</u>	<u>Dev</u>
12	Mr. Dipak Bhimrao More	<u>Dipak</u>	<u>Dipak</u>	<u>Dipak</u>	<u>Dipak</u>	<u>Dipak</u>	<u>Dipak</u>	<u>Dipak</u>	<u>Dipak</u>
13	Ku. Divya Rambhau Gujar	<u>Divya</u>	<u>Divya</u>	<u>Divya</u>	<u>Divya</u>	<u>Divya</u>	<u>Divya</u>	<u>Divya</u>	<u>Divya</u>
14	Ku. Divyani Dinesh Dhurve	<u>Divyani</u>	<u>Divyani</u>	<u>Divyani</u>	<u>Divyani</u>	<u>Divyani</u>	<u>Divyani</u>	<u>Divyani</u>	<u>Divyani</u>





S.N.	Name of student	16/12/24	12/12/24	18/12/24	14/12/24	15/12/24	16/12/24	17/12/24	26/12/24
15	Ku. Gauri Anil Maskare	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
16	Ku. Gauri Satish Kadu	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
17	Ku. Gayatri Bajrangsinha Rajpurhit	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
18	Ku. Gayatri Rajesh Yewale	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
19	Ku. Ishika Sachinrao Chaudhane	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
20	Ku. Janvi Prashant Pise	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
21	Mr. Karik Ganesh Singh Jarole	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
22	Mr. Kaushal Jitendra Tayade	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
23	Ku. Komal Prashant Potdukhe	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
24	Ku. Krutika Arunrao Arbad	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
25	Mr. Kuldip Ravindra Reche	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
26	Ku. Mahi Santosh Dhokane	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
27	Mr. Nakul Divakar Tayde	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
28	Ku. Premna Anil Makode	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
29	Ku. Priyanka Siddharth Sardar	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
30	Ku. Ruchika Sanjaysingh Khojare	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
31	Ku. Rutuja Raosaheb Pakhan	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>
32	Mr. Sahil Bhashkar Shingnapure	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>	<del>Prakash</del>





S.N.	Name of Student	16/12/24	12/12/24	13/12/24	14/12/24	15/12/24	16/12/24	17/12/24	20/12/24
33	Ku. Sakshi Naresh Rekhate	<del>Sakshi</del>	<del>Sakshi</del>	<del>Sakshi</del>	<del>Sakshi</del>	<del>Sakshi</del>	<del>Sakshi</del>	<del>Sakshi</del>	<del>Sakshi</del>
34	Ku. Sakshi Santosh Bhongade	S.S. Bhongade	S.S. Bhongade	S.S. Bhongade	S.S. Bhongade	S.S. Bhongade	S.S. Bhongade	S.S. Bhongade	S.S. Bhongade
35	Ku. Sanika Ajabrao Ghule	<del>Ajabe</del>	<del>Ajabe</del>	<del>Ajabe</del>	<del>Ajabe</del>	<del>Ajabe</del>	<del>Ajabe</del>	<del>Ajabe</del>	<del>Ajabe</del>
36	Mr. Shantanu Sunilrao Patukale	<del>Shantu</del>	<del>Shantu</del>	<del>Shantu</del>	<del>Shantu</del>	<del>Shantu</del>	<del>Shantu</del>	<del>Shantu</del>	<del>Shantu</del>
37	Ku. Shital Rajendra Bhawe	<del>Bhawe</del>	<del>Bhawe</del>	<del>Bhawe</del>	<del>Bhawe</del>	<del>Bhawe</del>	<del>Bhawe</del>	<del>Bhawe</del>	<del>Bhawe</del>
38	Ku. Shivani Manikaro Shirole	<del>Shirale</del>	<del>Shirale</del>	<del>Shirale</del>	<del>Shirale</del>	<del>Shirale</del>	<del>Shirale</del>	<del>Shirale</del>	<del>Shirale</del>
39	Ku. Shivani Ravindra Ghule	<del>Ghule</del>	<del>Ghule</del>	<del>Ghule</del>	<del>Ghule</del>	<del>Ghule</del>	<del>Ghule</del>	<del>Ghule</del>	<del>Ghule</del>
40	Ku. Shravani R. Khalokar	<del>Khalokar</del>	<del>Khalokar</del>	<del>Khalokar</del>	<del>Khalokar</del>	<del>Khalokar</del>	<del>Khalokar</del>	<del>Khalokar</del>	<del>Khalokar</del>
41	Ku. Shrutika Rajendara Gurav	<del>Gurav</del>	<del>Gurav</del>	<del>Gurav</del>	<del>Gurav</del>	<del>Gurav</del>	<del>Gurav</del>	<del>Gurav</del>	<del>Gurav</del>
42	Ku. Switi Radheshyam Shinde	<del>Shinde</del>	<del>Shinde</del>	<del>Shinde</del>	<del>Shinde</del>	<del>Shinde</del>	<del>Shinde</del>	<del>Shinde</del>	<del>Shinde</del>
43	Ku. Tanaya Satish Kharad	<del>Kharad</del>	<del>Kharad</del>	<del>Kharad</del>	<del>Kharad</del>	<del>Kharad</del>	<del>Kharad</del>	<del>Kharad</del>	<del>Kharad</del>
44	Ku. Tanvi Ganesh Gorde	<del>Gorde</del>	<del>Gorde</del>	<del>Gorde</del>	<del>Gorde</del>	<del>Gorde</del>	<del>Gorde</del>	<del>Gorde</del>	<del>Gorde</del>
45	Ku. Tanvi Sunil Dongardive	<del>Dongardive</del>	<del>Dongardive</del>	<del>Dongardive</del>	<del>Dongardive</del>	<del>Dongardive</del>	<del>Dongardive</del>	<del>Dongardive</del>	<del>Dongardive</del>
46	Mr. Tejas Sureshrao Jawanjale	<del>Jawanjale</del>	<del>Jawanjale</del>	<del>Jawanjale</del>	<del>Jawanjale</del>	<del>Jawanjale</del>	<del>Jawanjale</del>	<del>Jawanjale</del>	<del>Jawanjale</del>
47	Ku. Ummati Dinesh Ruchake	<del>Ruchake</del>	<del>Ruchake</del>	<del>Ruchake</del>	<del>Ruchake</del>	<del>Ruchake</del>	<del>Ruchake</del>	<del>Ruchake</del>	<del>Ruchake</del>
48	Ku. Vedika Namdev Yeul	<del>Yeul</del>	<del>Yeul</del>	<del>Yeul</del>	<del>Yeul</del>	<del>Yeul</del>	<del>Yeul</del>	<del>Yeul</del>	<del>Yeul</del>



HEAD  
DEPARTMENT OF PHYSICS  
SMT RADHABAI SARDAR COLLEGE  
ANJANGAON SURJI

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**Smt Radhabai Sarda Arts, commerce & Science College, Anjangaon Surji**  
**Department of Physics**  
**Certificate course in**  
**Basics of Thin Film Technology**

**Time: 2 Hours**

**Max Marks: 30**

Q. 1 Attempt any four

- a) What are the different factors affecting the thickness of film? (4)
- b) Give the applications of thin films (4)
- c) State the drawbacks of Physical Vapor Deposition techniques (4)
- d) Explain how substrate affects the growth of thin film (4)
- e) Explain four probe technique to measure resistivity of thin film (4)
- f) What are the advantages of CBD technique over PVD techniques? (4)

Q.2 Attempt any two

- a) Explain briefly Chemical Bath Deposition technique for thin film synthesis. (7)
- b) Explain briefly Spray Pyrolysis technique for thin film deposition. (7)
- c) Explain various steps involved in thin film formation (7)

----- *End* -----



Shri Sarda Education Society (Trust)'s  
Smt. Radhabai Sarda Arts, Commerce & Science College, Anjangaon Surji.  
District- Amravati 444705

**DEPARTMENT OF PHYSICS**

**Certificate course**

Title of course : *Basics of Thin Film Technology*

Date of Examination: *17/2/2024*

Max Marks : *30*

**Attendance sheet**

S.N.	Name of Student	Signature
1	Ku. Aarti Subhash Sagane	<i>Aagane</i>
2	Ku. Adiba Anjum Mukhtar Khan	<i>Adijm</i>
3	Mr. Aditya Suresh Bundile	<i>AB</i>
4	Ku. Akanksha Narandra Bhonde	<i>Akhanale</i>
5	Mr. Akshay Devendra Sherkar	<i>Asherkar</i>
6	Ku. Anisha Shrikrushna Kalpande	<i>Ak.</i>
7	Mr. Anuj Shriram Datir	<i>Anuj D</i>
8	Mr. Atharva Nitinrao Mankar	<i>Amr</i>
9	Ku. Chanchal Jivan Dhule	<i>CDhule</i>
10	Ku. Damini Suresh Neware	<i>Dneware</i>
11	Mr. Dev Manoj Ghadekar	<i>Dev</i>
12	Mr. Dipak Bhimrao More	<i>Dipak B. more</i>
13	Ku. Divya Rambhau Gujar	<i>Dg</i>
14	Ku. Divyani Dinesh Dhurve	<i>Dhurve</i>
15	Ku. Gauri Anil Maskare	<i>GMaskare</i>
16	Ku. Gauri Satish Kadu	<i>Gkadu</i>
17	Ku. Gayatri Bajrangsinha Rajpurohit	<i>Gayatri</i>
18	Ku. Gayatri Rajesh Yewale	<i>Gayatri</i>
19	Ku. Ishika Sachinrao Chaukhande	<i>Ishika</i>
20	Ku. Janhvi Prashant Pise	<i>jpise</i>
21	Mr. Kartik Ganesh Singh Jarole	<i>KJ</i>
22	Mr. Kaushal Jitendra Tayade	<i>KJ</i>
23	Ku. Komal Prashant Potdukhe	<i>KPotdukhe</i>
24	Ku. Krutika Arunrao Arbad	<i>KArbad</i>
25	Mr. Kuldip Ravindra Reche	<i>KR</i>





26	Ku. Mahi Santosh Dhokane	<u>Mahi</u>
27	Mr. Nakul Divakar Tayde	<u>Nakul Tayde</u>
28	Ku. Prerna Anil Makode	<u>Prerna Makode</u>
29	Ku. Priyanka Siddharth Sardar	<u>Priyanka Sardar</u>
30	Ku. Ruchika Sanjaysingh Khojare	<u>Ruchika Khojare</u>
31	Ku. Rutuja Raosaheb Pakhan	<u>Rutuja Pakhan</u>
32	Mr. Sahil Bhashkar Shingnapure	<u>S.B. Shingnapure</u>
33	Ku. Sakshi Naresh Rekhate	<u>Sakshi Rekhate</u>
34	Ku. Sakshi Santosh Bhongade	<u>S.S. Bhongade</u>
35	Ku. Sanika Ajabrao Ghule	<u>Sanika Ghule</u>
36	Mr. Shantanu Sunilrao Patukale	<u>Shantanu Patukale</u>
37	Ku. Shital Rajendra Bhawe	<u>Shital Bhawe</u>
38	Ku. Shivani Manikar Shirole	<u>Shivani Shirole</u>
39	Ku. Shivani Ravindra Ghule	<u>Shivani Ghule</u>
40	Ku. Shravani R. Khalokar	<u>Shravani Khalokar</u>
41	Ku. Shrutika Rajendara Gurav	<u>Shrutika Gurav</u>
42	Ku. Switi Radheshyam Shinde	<u>Switi Shinde</u>
43	Ku. Tanaya Satish Kharad	<u>Tanaya Kharad</u>
44	Ku. Tanvi Ganesh Gorde	<u>Tanvi Gorde</u>
45	Ku. Tanvi Sunil Dongardive	<u>Tanvi Dongardive</u>
46	Mr. Tejas Sureshrao Jawanjal	<u>Tejas Jawanjal</u>
47	Ku. Unnati Dinesh Ruchake	<u>Unnati Ruchake</u>
48	Ku. Vedika Namdev Yeul	<u>Vedika Yeul</u>



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17/12/2024  
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DEPARTMENT OF PHYSICS  
SMT. RADHABA SARDAR COLLEGE  
ANJANGAON SURJI

**DEPARTMENT OF PHYSICS**

**Certificate course**

Title of course : *Basics of Thin Film Technology*

Date of Examination: *17/2/2024*

Max Marks : *30*

**Marks sheet**

S.N.	Name of Student	Marks Obtained	
1	Ku. Aarti Subhash Sagane	20	Twenty
2	Ku. Adiba Anjum Mukhtar Khan	20	Twenty
3	Mr. Aditya Suresh Bundile	18	Eighteen
4	Ku. Akanksha Narandra Bhonde	21	Twenty one
5	Mr. Akshay Devendra Sherkar	18	Eighteen
6	Ku. Anisha Shrikrushna Kalpande	21	Twenty one
7	Mr. Anuj Shriram Datir	17	Seventeen
8	Mr. Atharva Nitinrao Mankar	19	Nineteen
9	Ku. Chanchal Jivan Dhule	28	Twenty Eight
10	Ku. Damini Suresh Neware	20	Twenty
11	Mr. Dev Manoj Ghadekar	18	Eighteen
12	Mr. Dipak Bhimrao More	23	Twenty three
13	Ku. Divya Rambhau Gujar	22	Twenty two
14	Ku. Divyani Dinesh Dhurve	21	Twenty one
15	Ku. Gauri Anil Maskare	22	Twenty two
16	Ku. Gauri Satish Kadu	22	Twenty two
17	Ku. Gayatri Bajrangsinha Rajpurohit	22	Twenty two
18	Ku. Gayatri Rajesh Yewale	21	Twenty One
19	Ku. Ishika Sachinrao Chaukhande	20	Twenty
20	Ku. Janhvi Prashant Pise	20	Twenty
21	Mr. Kartik Ganesh Singh Jarole	20	Twenty
22	Mr. Kaushal Jitendra Tayade	17	Seventeen
23	Ku. Komal Prashant Potdukhe	20	Twenty
24	Ku. Krutika Arunrao Arbad	26	Twenty six
25	Mr. Kuldip Ravindra Reche	15	Fifteen





26	Ku. Mahi Santosh Dhokane	20	Twenty
27	Mr. Nakul Divakar Tayde	16	Sixteen
28	Ku. Prerna Anil Makode	27	Twenty Seven
29	Ku. Priyanka Siddharth Sardar	23	Twenty three
30	Ku. Ruchika Sanjaysingh Khojare	23	Twenty three
31	Ku. Rutuja Raosaheb Pakhan	18	Eighteen
32	Mr. Sahil Bhashkar Shingnapure	16	Sixteen
33	Ku. Sakshi Naresh Rekhate	23	Twenty three
34	Ku. Sakshi Santosh Bhongade	23	Twenty three
35	Ku. Sanika Ajabrao Ghule	21	Twenty one
36	Mr. Shantanu Sunilrao Patukale	16	Sixteen
37	Ku. Shital Rajendra Bhave	19	Nineteen
38	Ku. Shivani Manikaro Shirole	20	Twenty
39	Ku. Shivani Ravindra Ghule	20	Twenty
40	Ku. Shravani R. Khalokar	20	Twenty
41	Ku. Shrutika Rajendara Gurav	19	Nineteen
42	Ku. Switi Radheshyam Shinde	16	Sixteen
43	Ku. Tanaya Satish Kharad	18	Eighteen
44	Ku. Tanvi Ganesh Gorde	21	Twenty one
45	Ku. Tanvi Sunil Dongardive	22	Twenty two
46	Mr. Tejas Sureshrao Jawanjal	15	Fifteen
47	Ku. Unnati Dinesh Ruchake	18	Eighteen
48	Ku. Vedika Namdev Yeul	20	Twenty.



*pm*  
*12/2/2024*

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DEPARTMENT OF PHYSICS  
SMT. RADHABAI SARDAR COLLEGE  
ANJANGAON SURJI





Shri Sardar Education Society (Trust)'s  
Smt. Radhabai Sardar Arts, Commerce & Science College,  
Anjangaon Surji, District- Amravati (Maharashtra)  
NAAC Accredited 'A' with CGPA 3.21

## Department of Physics

# Certificate

*This is to certify that*

*Shri/Ku. Chanchal Jivan Dhule Class B.Sc. I*

*has completed a Certificate Course entitled "Basics of Thin Film Technology"  
conducted by Departments of Physics from 1/2/2024 to 20/2/2024 and ranked 1.*

*pm*

Shri R. B. Mankar  
Convener

*pm*

Dr Bashisth Choubey  
Principal





Shri Sarda Education Society (Trust)'s  
**Smt. Radhabai Sarda Arts, Commerce & Science College,**  
Anjangaon Surji, District- Amravati (Maharashtra)  
NAAC Accredited 'A' with CGPA 3.21

## Department of Physics

# Certificate

*This is to certify that*

*Shri/Ku. Perna Anil Makode Class B.Sc.I*

*has completed a Certificate Course entitled "Basics of Thin Film Technology"  
conducted by Departments of Physics from 1/2/2024 to 20/2/2024 and ranked 2.*

Shri R. B. Mankar  
Convener

Dr Bashisth Choubey  
Principal

Shri Sarda Education Society (Trust)'s  
Smt. Radhabai Sarda Arts, Commerce & Science College, Anjangaon Surji.  
District- Amravati (Maharashtra) 444705  
NAAC Accredited 'A' with CGPA 3.21

## DEPARTMENT OF PHYSICS

Certificate course in  
Basics of Thin Film Technology  
Application Form  
(Session 2023-2024)



1. Applicant's name : Ky. Chanchal Jivan Dhule
2. Father's Name : Jivan Shrikrushna Dhule
3. Address : At. Post Pandhori (Kha)  
To: Anjangaon surji Dist: Amravati
4. Email : pratikdhule16@gmail.com
5. Mobile No. : 9860036054
6. Gender : Female
7. Date of Birth : 14-09-2003
8. Studying in Class : B.Sc - I
9. Subjects Offered : Eng, Mar, Phy, Computer sci, Maths
10. College ID : 4669

I certify that the information I have given in this application is true. I am aware of rules and regulations of certificate course

@Dhule  
Applicant's Signature



Shri Sarda Education Society (Trust)'s  
Smt. Radhabai Sarda Arts, Commerce & Science College, Anjangaon Surji.  
District- Amravati (Maharashtra) 444705  
NAAC Accredited 'A' with CGPA 3.21

## DEPARTMENT OF PHYSICS

Certificate course in  
Basics of Thin Film Technology  
Application Form  
(Session 2023-2024)



1. Applicant's name : Sakshi Naresh Rekhat
2. Father's Name : Naresh kisan Rekhat
3. Address : Shivaji Nagar,  
Anjangaon Surji.
4. Email : SakshiEekhat14@gmail.com
5. Mobile No. : 7020124902
6. Gender : Female
7. Date of Birth : 14/01/2005
8. Studying in Class : B.Sc - I
9. Subjects Offered : Eng, Mar, Phy, Maths, computer sci.
10. College ID : 4757



I certify that the information I have given in this application is true. I am aware of rules and regulations of certificate course

Sakshi  
Applicant's Signature



Shri Sarda Education Society (Trust)'s  
**Smt. Radhabai Sarda Arts, Commerce & Science College,**  
Anjangaon Surji, District- Amravati (Maharashtra)  
NAAC Accredited 'A' with CGPA 3.21

## Department of Physics

# Certificate

*This is to certify that*

*Shri/Ku.\_\_\_\_\_ Class\_\_\_\_\_*

*has completed a Certificate Course entitled "Basics of Thin Film Technology"  
conducted by Departments of Physics from 1/2/2024 to 20/2/2024 and ranked \_\_\_\_\_.*

Shri R. B. Mankar  
Convener

Dr Bashisth Choubey  
Principal