

NEWSLETTER

METALLURGY DEPARTMENT

(NBA ACCREDITED 2023-25)

July 2023 to December 2023



METALLURGY

राष्ट्रीय प्रत्यायन बोर्ड

चौथा तल, ईस्ट टावर, एन. बी. सी. सी. प्लेस, भीष्म पितामह मार्ग, प्रगति विहार, लोधी रोड, नई दिल्ली -110003
NATIONAL BOARD OF ACCREDITATION
4th Floor, East Tower, NBCC Place, Bhisham Pitamah Marg, Pragati Vihar, Lodhi Road, New Delhi 110003



F.No- 20-78-2013-NBA

Date: 27-04-2022

To
The Principal
Government Engineering College,
Gandhinagar Nr. G.E.B. Cross Road,
Sector - 28, Gandhinagar –Gujarat- 382028

Subject: Accreditation status of program applied by Government Engineering College, Gandhinagar Nr. G.E.B. Cross Road, Sector - 28, Gandhinagar –Gujarat- 382028.

Sir,

This has reference to your application I.D. No. 5695-15/06/2021 seeking accreditation by National Board of Accreditation to UG Engineering program offered by **Government Engineering College, Gandhinagar Nr. G.E.B. Cross Road, Sector - 28, Gandhinagar –Gujarat- 382028.**

2. An Expert Team conducted onsite evaluation of the program from **18th to 20th February, 2022.** The report submitted by the Expert Team was considered by the concerned Committees constituted for the purpose in NBA. The Competent Authority in NBA has approved the following accreditation status to the program as given in the table below:

Sl. No.	Name of the Program(s) (UG)	Basis of Evaluation	Accreditation Status	Period of validity	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
1.	Metallurgy	Tier II June 2015 Document	Accredited	Academic Years 2022-2023 to 2024-2025 i.e. up to 30-06-2025	Accreditation status granted is valid for the period indicated in Col.5 or till the program has the approval of the Competent Authority, whichever is earlier

3. It may be noted that only students who graduate during the validity period of accreditation, will be deemed to have graduated with an NBA accredited degree.

4. The program has been granted accreditation for 3 years. **Government Engineering College, Gandhinagar Nr. G.E.B. Cross Road, Sector - 28, Gandhinagar –Gujarat- 382028** should submit the Compliance Report at least six months before the expiry of validity of accreditation mentioned above so as to be eligible for consideration by the concerned Committee in NBA for further processing of the accreditation status.

5. The accreditation status awarded to the program as indicated in the above table does not imply that the accreditation has been granted to **Government Engineering College, Gandhinagar Nr. G.E.B. Cross Road, Sector - 28, Gandhinagar –Gujarat- 382028** as a whole. **As such the Institution should nowhere along with its name including on its letter head etc. write that it is accredited by NBA because it is program accreditation and not Institution accreditation. If such an instance comes to NBA's notice, this will be viewed seriously.** Complete name of the program(s) accredited, level of program(s) and the period of validity of accreditation, as well as the Academic Year from which the accreditation is effective should be mentioned unambiguously whenever and wherever it is required to indicate the status of accreditation by NBA.

6. The accreditation status of the above program is subject to change on periodic review, if needed by the NBA. It is desired that the relevant information in respect of accredited program as indicated in the table in paragraph 2, appears on the website and information bulletin of the Institute.

Tel: +91 11 2436 0620-22, 2436 0654; Telefax: +91 11 4308 4903
Website: <http://www.nbaind.org> | Email: membersecretary@nbaind.org

Contd./_

-2-

7. The accreditation status awarded to the program as indicated in table in paragraph 2 above is subject to maintenance of the current standards during the period of accreditation. If there are any changes in the status (major changes of faculty strength, organizational structure etc.), the same are required to be communicated to the NBA, with an appropriate explanatory note.

8. A copy each of the Report of Chairman of the Visiting Team and Evaluators' Report in respect of the above program is enclosed.

9. If the Institute is not satisfied with the decision of NBA, it may appeal within thirty days of receipt of this communication giving reasons for the same and by paying the requisite fee.

Yours faithfully,

(Dr. Anil Kumar Nassa)
Member Secretary

Encls.: 1. Copy of Report of Chairman of the Visiting Team.
2. Copy of Expert Report of the Visiting Team.

GOVERNMENT ENGINEERING COLLEGE

SEC-28. GANDHINAGAR

ABOUT THE INSTITUTE

Established in 2004, Government Engineering College, Gandhinagar (GEC-Gn) takes pride in its highly motivated students. Our students are life-long assets that help this institute to continuously evolve and work towards its Vision. Approved by AICTE. The College is administrated by Directorate of Technical Education, Gujarat State, Gandhinagar. GEC Gn is affiliated to Gujarat Technological University. GEC-Gn offers its students a wide range of courses like Biomedical, Robotics & Automation, Computer, EC, IC, IT, Electrical, Civil, Mechanical and Metallurgy.

VISION OF THE INSTITUTE

To be a premier engineering institution, imparting quality education for innovative solutions relevant to society and environment.

MISSION OF THE INSTITUTE

- To develop human potential to its fullest extent so that intellectual and innovative engineers can emerge in a wide range of professions.
- To advance knowledge and educate students in engineering and other areas of scholarship that will best serve the nation and the world in future.
- To produce quality engineers, entrepreneurs and leaders to meet the present and future needs of society as well as environment.

METALLURGY

ABOUT THE DEPARTMENT

The Metallurgy Department since its inception in 2008 is a backbone of GEC-Gandhinagar's events, research activities and initiatives. It is a unique initiative of Government of Gujarat in the present science and technology education and research scenario of India. At present, the department offers a four year undergraduate course in engineering. Faculty members are good blend of industrial/ academic research experienced, studied from national and state reputed institutes. Department has developed COQ (Centre for Quality) NDT which established under "Vibrant Gujarat-2019"- Financial MOU in collaboration with Gulfnde along with various well equipped metallurgical laboratories.

Currently, the focus of department activities are multi-directional with an emphasis on both research and education. Our collaborations with FCIPT, CFER, INDUS University, PDEU, IIM-Baroda Chapter, IIF- Ahmedabad Chapter, ASM International - Gujarat Chapter, IE-Gujarat Section, etc. Students are encouraged and supported to actively participate in various curricular and non-curricular activities at different level.

VISION OF THE DEPARTMENT

Developing excellence in Metallurgy Engineering education through research, development innovation and team work for the benefit of society and environment.

MISSION OF THE DEPARTMENT

- To prepare competent metallurgy engineers who can apply metallurgical fundamentals to control and manage different metallurgical and materials processing operations to produce quality metals products in industries.
- To deliver information about current trends in the field of metallurgy and materials to the students.
- To encourage students to work on innovative projects related to metallurgy engineering for managing defects free, economical, energy efficient products, processes or devices to best serve the nation to fulfil the socio-economic, techno-commercial and environmental needs.

LIST OF FACULTY MEMBERS WITH QUALIFICATION

Sr. No.	Name of Faculty	Qualification	Designation
1	Dr. I. B. Dave	Ph.D (Metallurgy)	Professor & Head
2	Prof. S. I. Patel	ME (Met. & Mat. Engg.)	Assistant Professor
3	Dr. D. G. Sharma	Ph.D (Metallurgy)	Assistant Professor
4	Dr. H. H. Jadav	Ph.D (Metallurgy)	Assistant Professor
5	Dr. P. K. Nanavati	Ph.D (Met. & Mat. Engg.)	Assistant Professor
6	Prof. D. V. Mahant	ME (Met. & Mat. Engg.)	Assistant Professor
7	Prof. B. R. Rana	ME (Met. & Mat. Engg.)	Assistant Professor
8	Prof. H. H. Thakar	ME (Met. & Mat. Engg.)	Assistant Professor
9	Prof. R. C. Ghanghas	ME (Met. & Mat. Engg.)	Assistant Professor
10	Dr. M. S. Dani	Ph.D (Metallurgy)	Assistant Professor

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ACHIVEMENTS OF THE FACULTIES



Dr. I B Dave completed the 8 Weeks NPTEL-AICTE Faculty Development Programme “Nature and Properties Of Materials-an Introductory Course” 24.7.23-15.9.23.

Delivered expert talk on “Heat Treatment”, at One Week DTE approved FDP on “Metallurgy for Engineers” organized by NITTTR, Gujarat Extension Center Ahmedabad in association with Metallurgy Department, Government Engineering College, Sector 28, Gandhinagar during 16th-20th October 2023.



Prof. S I Patel completed the 8 Weeks NPTEL-AICTE Faculty Development Programme “Nature and Properties Of Materials-an Introductory Course” 24.7.23-15.9.23.

Dr. D G Sharma delivered a technical session on “Corrosion: A Dangerous Phenomenon..” in Student Innovation Fest (SIF 2023); Organized By Vigyan Gurjari on 10th August 2023.

Being a member of the World record holder team (Maximum students participate in Science and Innovation expert talk series in a single day; Student Innovation Fest (SIF 2023) 10th August 2023) received a certificate and medal from World Records India.

Completed the 8 Weeks NPTEL-AICTE Faculty Development Programme “Nature and Properties Of Materials-an Introductory Course” 24.7.23-15.9.23 With Elite Certification (82% Score).

Completed One Week DTE approved Faculty Development Programme on “Metallurgy for Engineers” organized by NITTTR, Gujarat Extension Center Ahmedabad in association with Metallurgy Department, Government Engineering College, Sector 28, Gandhinagar during 16th-20th October 2023.



Received appreciation certificate for acted as Committee member of Vibrant Gujarat-Bhartiya Vigyan sammelan 2023 jointly organized by Vijnana Bharati and Government of Gujarat during 21-24 December 2023 at Science City, Ahmedabad. For the same he is facilitated by Dr V P N Nampoori, International School of Photonics, Cochin University of Science And Technology, Cochin, Kerala.

Received appreciation certificate for acted as Theme Coordinator (Indian Knowledge System) in National Conference as part of Vibrant Gujarat-Bhartiya Vigyan sammelan 2023 jointly organized by Vijnana Bharati and Government of Gujarat during 21-24 December 2023 at Science City, Ahmedabad

Received appreciation certificate for acted as Jury Member (Theme: 1. Grass root innovation 2. Scientific heritage tourism) in National Conference as part of Vibrant Gujarat-Bhartiya Vigyan sammelan 2023 jointly organized by Vijnana Bharati and Government of Gujarat during 21-24 December 2023 at Science City, Ahmedabad

Presented a research poster “Perovskite Solar Cell” along with team in National Conference (Theme: Green Energy, Green Future) as part of Vibrant Gujarat-Bhartiya Vigyan sammelan 2023 jointly organized by Vijnana Bharati and Government of Gujarat during 21-24 December 2023 at Science City, Ahmedabad

Appointed as Vice-Chairman of IIM Baroda Chapter for the Year 2023-24

ACHIVEMENTS OF THE FACULTIES



Dr. H H Jadav completed the 8 Weeks NPTEL-AICTE Faculty Development Programme "Nature and Properties Of Materials-an Introductory Course" 24.7.23-15.9.23 With 70% Score.

Delivered expert talk on "Extraction of Non Ferrous Metals", at One Week DTE approved FDP on "Metallurgy for Engineers" organized by NITTTR, Gujarat Extension Center Ahmedabad in association with Metallurgy Department, Government Engineering College, Sector 28, Gandhinagar during 16th-20th October 2023.

Worked as Co-coordinator for one week DTE approved faculty development program "Metallurgy for Engineers" organized by NITTTR, Bhopal Ext. Center Ahmedabad in association with the Metallurgy Department, Government Engineering College, Sector 28, Gandhinagar during 16th-20th, October 2023.

Dr. P K Nanavati delivered two technical sessions on "Welding Metallurgy and Weldability of Steels" and "Destructive Testings of the Welded Joints" at the IIW-India, Baroda branch organized "Welding Inspector Course (WIC)-2023 on 25th September '23 at Hotel Treatotel Ahmedabad, Gujarat. India

Received a recognition as a welding blog author (www.weldingknowledge.co.in) with the publication of three technical case-study articles on "Weld Metal Analysis with WRC-1992 diagram for dissimilar metal welds" in the IndiaWelds Technical symposium New Delhi. The publication booklet was unveiled on 4th Nov 23.



Delivered a Technical Session on "Welding qualification (Procedure and Performance) of Tube -to-Tubesheet Joints in Heat Exchangers" online during 14th, December 2023, in Two-days certificate program on Heat exchanger damage mechanisms, Material selection, inspection, and failure Investigation by Evolve, TCR Advanced Engg. Baroda.

Delivered a technical session on "Back Purging Techniques in Stainless-Steel Fabrication, Location : Anand, Gujarat, August 26th, 2023
Delivered Technical Sessions on "Welding Procedure and Performance Qualification (WPS-PQR-WPQ) as per ASME SEC-IX on 25th August, 2023 Basics of NDT, DT, WPS/PQR/WPQ Training Program at Industrial Testing Centre Pvt Ltd., Ahmedabad.

Delivered a technical session on "Welding Metallurgy and Welding Procedure Qualification of SA-213 P/T91 (9Cr-1Mo) material used in boiler and steam tube applications" in the program "Welding ASME Codes and NDT Practice" on-site training program at AMGEN Torrent Power, Ahmedabad, held on 3rd August 2023 organised by TCR Advanced Engineering.

Demonstrated various welding processes, at One Week DTE approved FDP on "Metallurgy for Engineers" organized by NITTTR, Gujarat Extension Center Ahmedabad in association with Metallurgy Department, Government Engineering College, Sector 28, Gandhinagar during 16th-20th October 2023.

ACHIVEMENTS OF THE FACULTIES



Prof. D V Mahant participated at One Week DTE approved FDP on "Metallurgy for Engineers" organized by NITTTR, Gujarat Extension Centre Ahmedabad in association with Metallurgy Department, Government Engineering College, Sector 28, Gandhinagar during 16th-20th October 2023



Prof. B R Rana completed the 8 Weeks NPTEL-AICTE Faculty Development Programme "Nature and Properties Of Materials-an Introductory Course" 24.7.23-15.9.23 .

Demonstrated electrolytic powder production method, at One Week DTE approved FDP on "Metallurgy for Engineers" organized by NITTTR, Gujarat Extension Center Ahmedabad in association with Metallurgy Department, Government Engineering College, Sector 28, Gandhinagar during 16th-20th October 2023.

Prof. H H Thakar published a research paper in SCOPUS indexed journal. (Details are given in research activity).

Topper of NPTEL-AICTE approved a 12 week MOOC course on "Joining Technologies for Metals" with 90 % Gold Elite certification.



Received special appreciation from National Innovation Foundation-India (DST) for reviewing grassroots innovative ideas under "Inspire - Manak Awards 2023-24".

Received special appreciation from advisor KCG for highly esteemed contribution in planning implementation and organizing mega placement camps in all districts of Gujarat during July-Sept 2023.

Demonstrated various welding processes, at One Week DTE approved FDP on "Metallurgy for Engineers" organized by NITTTR, Gujarat Extension Center Ahmedabad in association with Metallurgy Department, Government Engineering College, Sector 28, Gandhinagar during 16th-20th October 2023.

PEDAGOGY SESSION

Sr. No	Name of Speaker	Department	Topic Delivered	Date
1	Dr. I. B. Dave	Metallurgy	Human Personality	02/09/2023
2	Dr. D G Sharma	Metallurgy	Crystal structure identification	16/09/2023
3	Prof. V N Modi	Mechanical	Advances in air conditioning	30/09/2023

GLIMPSES OF EXPERT LECTURE

Sr. No	Date	Speaker	Topic	Organizing Partner	Coordinator
1	19/10/2023	Mr. Gyanesh Singh	Olympus Microscopy of Alloy Steel	SSMEG	Dr. M S Dani
2	27/10/2023	Mr. Yakshil. B. Chokshil	Introduction of Ellingham Diagram and it's importance	SSMEG	Dr. M S Dani
3	5/10/2023	Dr. Mukesh Ranjan	Plasma Based Processing of Materials	FCIPT, IPR, Gandhinagar	Dr. D G Sharma Dr. H H Jadav
4	5/10/2023	Dr. Alphonsa Joseph	Potentiodynamic polarization test	FCIPT, IPR, Gandhinagar	Dr. D G Sharma Dr. H H Jadav
5	18/09/2023	Mr. Mahesh Pandya	NDT (4.0) & Quality control and Assurance Part—1	Eversendai Offshore, UAE	Dr. H H Jadav Prof. D V Mahant
6	18/09/2023	Mr. Mandarapu Kalyan Bhaskar	NDT (4.0) & Quality control and Assurance Part—2	Eversendai Offshore, UAE	Dr. H H Jadav Prof. D V Mahant

FDP ON METALLURGY FOR ENGINEERS

DTE approved Faculty Development Program on "Metallurgy for Engineers" was organized by NITTTR, Ext. Center Ahmedabad in association with Metallurgy Department, Government Engineering College, Sector 28, Gandhinagar during 16th - 20th October, 2023. Total of 38 faculties from different streams of Government and Grant in aid degree and diploma engineering institutes had participated in the program. Total of 14 professionals from academia and industry shared their expertise. The program also involved hands on training during visit at Metallurgy Department, Government Engineering College, Sector 28, Gandhinagar. Also, Olympus Microscope model DSX1000 was demonstrated for two days to the participants by M/s IR Tech, Pune. Dr I B Dave as chief guest for the valedictory session shared his views and distributed certificates.

As Metallurgy department, GEC, Gandhinagar has organized "Live demonstration of Olympus microscopy" on 19-10-23 at 2.30 pm onwards. Students of 7th, 5th and 3rd semester and faculty members of mechanical and Metallurgy department as well as PhD scholar from other colleges benefited by "Live demonstration of Olympus microscopy" on 19-10-23 between 2.30 pm onwards. Almost 30 students and 7 faculty members were benefited by this program. In Metallurgy Engineering, this topic is very much useful for physical metallurgy and microstructure analysis. Mr. Gyanesh Singh (Application specialist in Microscopy) from IR Technology Services Pvt. Ltd. has done live demonstration of DSX1000 and developed so many steel microstructures and also explain brief theory of it.

Olympus Corporation (Representative Director and President: Yasuo Takeuchi) announced the global launch of the DSX1000 digital microscope, which significantly improves users' inspection workflow and enables the analysis of a wide variety of samples with a single tool. This new product from Olympus' Scientific Solutions business was launched worldwide on June 3, 2019.



GLIMPSES OF ALUMNI MEET OCT 2023

As a part of Alumni meet two expert session by Alumni was conducted on Google Meet and in offline mode for majority current student of, 3rd, and 5th, and 7th sem on 21/10/2023. Total 45 participants have attended the session very interactively. Alumni speaker have given technical talk as well as carrier guidance for abroad study and settlement struggles as well as job finding. Current Metallurgy students have benefited a lot by gaining all information in this session. Session was concluded by vote of thanks by student member followed by cultural event 3:30 pm onwards.

Sr. No.	Time	Expert Details	Topic
1	11:00 am to 12:00 am	Mr. Bharat Verma Alumni Student Batch 2015 Passout GEC, MET Department PhD. Scholar IIT Roorkee	"The Era of Na-ion batteries" (Online)
2	12:00 pm to 01:00 pm	Mr. Dhaval Darji Alumni Student 2012 Passout GEC, MET Department Sr. Auditor, Intertek Ind. Pvt. Ltd.	"System Certification" (Offline)



STUDENT ATIVITES

1. Semicon India 2023

Date :- 28 /06/ 2023

Location :- Mahatma Mandir Convocation Centre, Gandhinagar

5th semester students went to Semicom India 2023 which was conducted at Mhatma Mandir in Gandhinagar. The three days session students get to learn about the importance of semiconductors and various investors who were there for their branding. The faculty members were present on the occasion with students.



2. Vasudhavadan (Tree Plantation)

Date :- 09/08/ 2023

Location :- Infront of Bulifding number 8

Tree Plantation was done to mark the tree plantation week and it was done with metallurgy professors. It marked with plantation of 20 tree sapling around department with 5th semester students.



3. Ahmedabad Management Association

Date :- 24/08/2023

Location :- AMA's at Ahmedabad

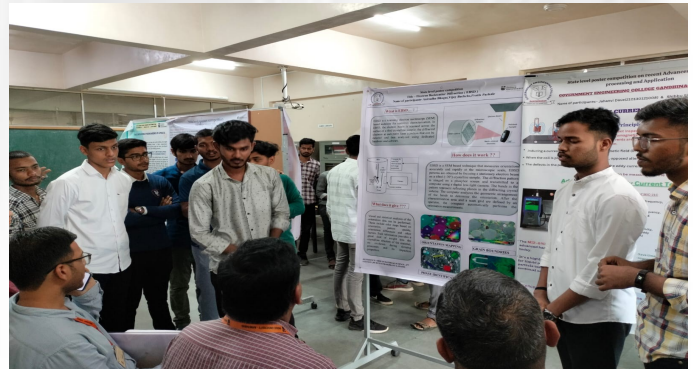
Many students from all departments were present at the AMA which had conduction of Startup in India and to grow small local handloom businesses across India. Students from many departments were present and attended the one day conference.



STUDENT ATIVITES

4. State Level Poster Presentation Competition.

The state level poster presentation competition on “Recent Advances in Materials processing and applications” was jointly organized by the Department of Materials and Metallurgical Engineering, IITE, IU, Ahmedabad & Department of Metallurgy, Government Engineering College, Gandhinagar on 26th Aug. 2023, Saturday. Total 10 teams had represented GEC, Gandhinagar. The student of seventh semester, Mr. Gunjil Bhavsar won the first prize in the competition. # State level competition #activity under MOU #Skill Development



5. Youth Parliament Conference

Date:- 05/09/2023

Location:- PDEU

5 Students from 7 semester of Metallurgy Department of Government Engineering College, Gandhinagar participated in Youth Parliament Conference Competition held at Pandit Deendayal Energy University on the auspicious occasion of Teachers’ Day. Mr Gunjil Bhavsar from 7 semester won Third prize in the competition.



5. Teacher Days’ Celebration.

Date :- 05/09/2023

Location :- Computer lab, Metallurgy Dept.

The teachers day was celebrated with great enthusiasm and spirit from 7th semester students who arranged and the anchoring was done by Mr. Nihar Huprikar. Cake was cut to mark the event. The event marked with speeches and thoughts were shared of each faculty member and ended with high tea.



STUDENT ACTIVITIES

5. Engineers' Day

The Metallurgy Department, Government Engineering College, sector 28, Gandhinagar had celebrated an Engineers' Day on 15th Sep 2023 by arranging expert sessions on Basic fundamentals and innovative trends in Metallurgy and Material science. The speakers invited were Mr. Vivek Singh, Ms. Prachi Sharma who are PhD scholars of IIT, Gandhinagar and Dr Arunsinh B Zala, Post Doc. Fellow, Institute of Plasma. Happy Engineers' Day # Expert Sessions # Interaction with young researchers



6. Poster Presentation Competition at Bhartiya Vigyan Sammelan.

Date :- 23/12/2023

Location :- Science city, Ahemdabad.

The poster presentation was carried under the guidance of Dr. Daulat Kumar Sharma and was one of the editor in Poster. Two students from 7th semester, Mr. Nihar Huprikar and Mr. Chirayu Pande; took part in 3 whole day activities at Science city. The theme was Green Energy and Conservation and the topic taken was Perovskite Solar Cells.



EXTRA ACTIVITES

Being a member of the World record holder team (Maximum students participate in Science and Innovation expert talk series in a single day; Student Innovation Fest (SIF 2023) 10th August 2023) Dr. Daulat Kumar Sharma received a certificate and medal from World Records India.



On 22 December 2023, The ASM members had an insightful visit to Dana Corporation Sanand plant. Company has 4 plants in India. Sanand plant is manufacturing off highway vehicles drive line parts and assembly. 15 participants from ASM Gujarat Chapter were welcomed by Senior leadership team of Dana plant.

STUDENT ACHIEVEMENTS

For being semester toppers in GTU exams Nihar Huprikar (210130121504) and Aar-zoo Bhalodiya (210130121009) was awarded appreciation certificate in presence of Principal GEC Gandhinagar on 15/8/2023.



Mr Gunjil Bhavsar got first prize in poster presenting competition held at Indus University.

Mr Gunjil Bhavsar got first prize in Youth Parliament Conference in PDEU at 05/09/23.



It is a proud moment for Metallurgy dept. that 2023 pass out student Shivam Korde (190130121010) has got admission in M. Tech (Metallurgical and Materials Engineering- HTTA) at IIT Madras.

TECHNICAL/ INDUSTRIAL VISIT

Date :- 05/10/2023

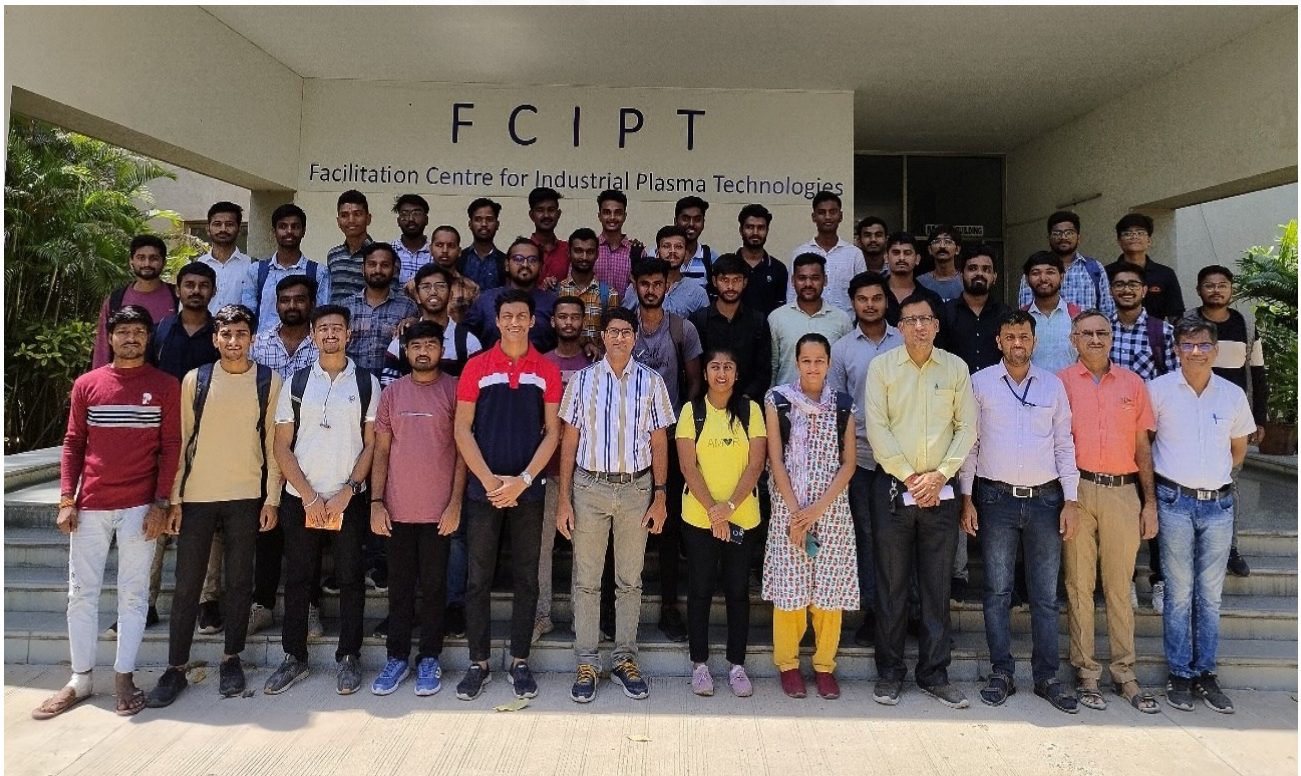
Location :- FCIPT, IPR, Gandhinagar.

Students of Government Engineering College, Gandhinagar of 5th & 7th semester planned visit at FCIPT with faculties Dr. Daulat Sharma and Dr. Harshadkumar Jadhav. The visit started with presentation at auditorium and based on Introduction to Plasma Research Facilities and work. Students clearance of doubts and thorough ideas were cleared with various curriculum based topics of Material Characterization of 7th semester and Environmental Degradation of Materials of 5th semester.

The pristine facility of 'The Institute for Plasma Research' can trace its roots back to early 1970's when a coherent and interactive programme of theoretical and experimental studies in plasma physics with an orientation towards understanding space plasma phenomena was established at the Physical Research laboratory.

FCIPT has a multi-disciplinary team of scientists and engineers with expertise in plasma physics, plasma chemistry, metallurgy, material science, power electronics and instrumentation.

The visit ended with group photos with the working faculties at FCIPT and with all the students in front of the main building and the visit was successful.



RESEARCH ACTIVITIES

Research Paper counter (Jan 2019 onwards)	Previously published	Addition	Total
	49	1	50

Sr. No.	Title of the Paper	Authors	Conference/ Journal
1	Performance optimization and investigation of metal -cored filler wires for high -strength steel during gas metal arc welding	Hemenkumar H. Thakar , Mrunalkumar D. Chaudhari, Jay J. Vora , Vivek Patel , Subhash Das , Din Bandhu , Manish Gupta and V. Suryaprakash Reddy	Journal of High Temperature Materials and Processes: Volume 42: issue 1 : Dec 2023

Sr No	Title of Event/ Conference	Title of Poster	Name of Students
1	State level Poster Presentation Competition at Indus University	Eddy current	Shibbu Singh
2			Jahanvi Dave
3		additive manufacturing	shreyas jamale
4			Prashant singh
5			Prashant nihlani
6		Introduction to Vacuum Heat Treatment	Raghav Deshpande
7			Viraj ovhal
8			Aman rathod
9		Shape memory alloy	Prayag Raut
10			Aditya Shende
11			Yash Shinde
12			Vijay Bachche
13		EBSD	Anirudha Bhagat
14			Pratik Parkale
15		Cold welding phenomenon in space	Arsh Shaikh
16			Shaikh Shafiq Raza
17			Amit gaygaye
18		pipe manufacturing by High frequency welding	Aditya kakade
19			Nayan Khante
20		To study Cu-Zn-Al Shape memory alloy	Amol Gonge
21			Abhi Darade
22			Harshal Shivankar
23			Ganesh Ghodke
24		Light Transmitting Concrete	Nihar Hapurikar
25			Mohit Natkar
26			Rushank Dhande
27			Pranay Manekar
28		Surface engineering - Laser polishing of Inconel 718	Gunjil Bhavsar
29			arzo Bhalodiya
30		3D printing	Kelvin Vikani
31	Vibrant Gujarat-Bhartiya Vigyan sammelan 2023		Dr. D G Sharma
		Nihar Hapurikar	
		Chirayu Pande	

TRAINING/INTERNSHIP (2 WEEKS)

During 27/7/2023 to 10/8/2023, all the students of 6th semester Metallurgy, have undergone 2 weeks training program in reputed industries as listed below as a part of GTU curriculum.

Sr. No.	En. No.	Name of Student	Name of Industry/Institute
1	200130121510	RAHUL YADAV	SIMPLEX CASTING LTD BHILAI
2	200130121004	CHIRAYU PANDE	INDIAN INSTITUTE OF TECHNOLOGY, GANDHINAGAR
3	200130121005	GUNJIL BHAVSAR	RAPICUT CARBIDES LIMITED
4	200130121006	KISHAN JETANI	HI-CON TECHNOCAST PVT LTD
5	200130121007	DHAVALSINH SOLANKI	GOLDFARBS INDUSTRIES PVT LTD.
6	200130121008	SMIT PATEL	FRIENDS CONCAST LIMITED
7	210130121501	MISHRA DIPAK KUMAR MANOJKUMAR	HERTZ TESTING AND TRAINING CENTER VATVA
8	210130121503	KASUNDRA MANTHANKUMAR M	JAY METAL TECH,SURAT
9	210130121504	HUPRIKAR NIHAR RAVINDRA	INDIAN INSTITUTE OF TECHNOLOGY, GANDHINAGAR
10	210130121505	BHUT JIGARKUMAR PRAVINBHAI	JAY METAL TECH. SURAT
11	210130121506	MANTHAN SANTOSH PUNE	CIE AUTOMOTIVE LTD
12	210130121507	BAKHADE SAGAR DNYANESHWAR	BHARAT FORGE LTD.
13	210130121508	MITTAL MAHENDRA KHAIRNAR	AARYA INDUSTRIES LTD.
14	210130121509	GHODKE GANESH NARAYAN	JYOTI HEAT TREATMENT
15	210130121510	SHIVANKAR HARSHAL SANJAY	JSW STEEL WORKS
16	210130121511	DARADE ABHISHEK DNYANDEO	PUNE HEAT TREATMENT
17	210130121512	THADKE PRATHMESH PRAKASH	HERTZ TESTING AND TRAINING CENTER VATVA
18	210130121513	LAVHE CHETAN BALASO	INDIAN INSTITUTE OF TECHNOLOGY, GANDHINAGAR
19	210130121514	PAWAR NANA BHAUSAHEB	HERTZ TESTING AND TRAINING CENTER VATVA
20	210130121515	GONGE AMOL PANDURANG	INDIAN INSTITUTE OF TECHNOLOGY, GANDHINAGAR
21	210130121516	JANI SHIVAM PRAKASHBHAI	HERTZ TESTING AND TRAINING CENTER VATVA
22	210130121517	GURRAM SARVESH ANIL	24K MECH LABORATORIES
23	210130121518	KODLE ROHIT SHARAN	VANAZ ENGINEERS LIMITED
24	210130121519	BORICHA PRIYANK SANJAYBHAI	TOPLAND ENGINES PVT.LTD.
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28	210130121523	BADWAIK CHETAN RAJKUMAR	SUNFLAG IRON AND STEEL COMPANY LIMITED
29	210130121525	DHANDE RUSHANK MILIND	SUNFLAG IRON AND STEEL COMPANY LIMITED

TRAINING/ACTIVITY ATTENDED BY FACULTY

Sr. No.	Name of the Faculty	Title of Training/Activity	Duration	Organizer
1	Dr. I B Dave	Successfully completing the course Nature and Properties of Materials -an Introductory Course with a consolidated score of 58%	July-Sept 2023	NPTEL-AICTE
		Appreciation letter for delivering an informative lecture as a guest speaker on "Sacrificial Anode"	14/09/2023	Indus University
2	Prof. S I Patel	Certificate of Appreciation in Student start-up and innovation policy (SSIP) appreciate Hackathon Jury Member	25/11/2023	Student start-up and innovation policy (SSIP)
3	Dr. D G Sharma	Successfully completing the course Nature and Properties of Materials -an Introductory Course with a consolidated score of 82%	July-Sept 2023	NPTEL-AICTE
		One Week DTE approved Faculty Development Programme on "Metallurgy for Engineers" organized by NITTTR,	16-20 Oct 2023	NITTTR, GEC Gn
		Appreciation certificate for acted as Theme Coordinator (IKS) in National Conference	21-24 Dec 2023	Vijnana Bharati and Government of Gujarat
		Received appreciation certificate for acted as Jury Member in National Conference	21-24 Dec 2023	Vijnana Bharati and Government of Gujarat
4	Dr. H. H. Jadav	Successfully completing the course Nature and Properties of Materials -an Introductory Course with a consolidated score of 70%	July-Sept 2023	NPTEL-AICTE
5	Prof. D V Mahant	One Week DTE approved Faculty Development Programme on "Metallurgy for Engineers" organized by NITTTR,	16-20 Aug 2023	NITTTR, GEC Gn
6	Prof. B R Rana	Successfully completing the course Nature and Properties of Materials -an Introductory Course	July-Sept 2023	NPTEL-AICTE
7	Prof. H H Thakar	Successfully completing the course Joining Technologies for Metal with a GOLD Elite consolidated score of 90%	July-Sept 2023	NPTEL-AICTE
		Appreciation from National Innovation Foundation-India (DST) for reviewing grassroots innovative ideas under "Inspire - Manak Awards 2023-24".	2023-24	NIF India
		Appreciation from advisor KCG for highly esteemed contribution in planning implementation and organizing mega placement camps in all districts of Gujarat during July-Sept 2023.	July-Sept 2023	Placement Cell Govt. of Gujarat

CERTIFICATES EARNED BY STUDENTS

Sr.no	Name of Student	Title of Training/Activity	Duration	Organizer
1	Gunjil Bhavsar	The state level poster presentation competition on "Recent Advances in Materials processing and applications" The student of seventh semester won the first prize in the competition.	26/08/2023	Metallurgy Department, GEC Gn Indus University IITE
		CERTIFICATE OF WINNER- The Student in semester 7 th Won Second Rank in "Youth Parliament Conference" Held on Teachers day	05/09/2023	PDEU
2	Deepak Mishra	Certificate for " Organizer Community of Sports Event"	15/08/2023	Metallurgy Department, GEC Gn
3	Nihar Ravindra Huprikar	CERTIFICATE OF APPRECIATION- securing highest SPI (9.6) B.E. (METALLURGY) in semester 5 during Academic Year 2022-2023.	15/08/2023	Metallurgy Department, GEC Gn
4	Arzoo Bhalodiya	CERTIFICATE OF APPRECIATION- securing highest SPI (7.48) B.E. (METALLURGY) in semester 3 during Academic Year 2022-2023.	15/08/2023	Metallurgy Department, GEC Gn

TECHNO RIDE

- By Dipakkumar Mishra (210130121501)

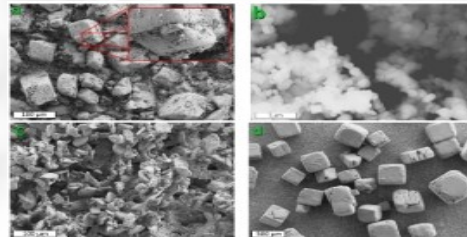
Introduction :- Tungsten is a potential candidate for plasma-facing components (PFC) in thermonuclear fusion tokamaks due to its high melting point and good thermal conductivity. However, it is brittle at room temperature and may cause cracking and reduced life span due to thermal cycling. To improve ductility, alloying elements like Ta, V, Cr, Ti, and Si are being considered. Cr is particularly important for improving tungsten oxidation resistance. Tungsten wires in light bulbs have a fine microstructure due to extrusion processes, but recrystallization can lead to loss of ductility. To address this, dispersed phases like La₂O₃, Y₂O₃, CeO₂, TiC, ZrC, or HfC can be added to improve ductility after thermal cycling. However, their use in plasma-facing components subjected to erosion should be considered cautiously due to potential pollution and metal hydrides formation.

Materials and Methods :- The researchers developed a new methodology for synthesizing refractory metal nano powders using self-propagating high-temperature synthesis (SHS) on pure W and MoNbW alloys. They also conducted a study on W-Cr alloys with up to 6 wt.% Cr, characterized using XRD, SEM, EBSD, and mechanical testing.

Nano powders Synthesis :- The powders were synthesized using a self-propagating high-temperature synthesis process, reducing metal oxides by magnesium in thermite-like reactions. The alloy was prepared by carefully weighting WO₃, Cr₂O₃, Mg, and NaCl, acting as oxidizer, reducer, and moderator. The alloy was then mixed in powder form using a 3D Turbula mixer for 24 hours, and thermite reactions were initiated.



Alloy	Cr wt.%	Cr at.%	WO ₃ (g)	Cr ₂ O ₃ (g)	Mg (g)	NaCl (g)
WCr2	2	6.73	24.717	0.585	12.082	16.13
WCr4	4	12.84	24.213	1.169	12.264	15.76
WCr6	6	18.41	23.708	1.754	12.447	15.39



The synthesis of 20g of alloys, including WCr₂, WCr₄, and WCr₆, involved adding 50% excess Mg and NaCl to increase global heat capacity and decrease final temperature. The reactions were performed under confinement to maintain gaseous magnesium availability. The study synthesizes stoichiometric W-Cr alloys using aluminium as a reducer and high gravity field separation. The powders' crystal structure is analysed using X-ray diffraction and Rietveld refinement using Materials analysis using diffraction software.

SPS Densification :- Spark plasma sintering was performed on a Syntec 515 S machine, allowing temperature measurements and pressure measurements. Densification experiments were conducted at various temperatures, with compaction pressure set at 100 MPa. Complex temperature cycles were not presented.

Densified Samples :- Densified samples were polished with cloths and analyzed using X-ray diffraction, Rietveld refinement, SEM, EDX, and EBSD. Mechanical properties were measured using Vickers hardness, and compression tests were performed on parallelepiped samples.

Results and Discussion :- Nano powders Synthesis :- EM observations show mostly rounded particle shapes with a large polydispersity, ranging from 10 to 200 nm. However, some areas show bounded particles, suggesting local melting during the reaction. The average particle size decreases with increased Cr amount. X-ray diffraction patterns reveal the α , Body Centered Cubic (BCC) crystal structure, with additional peaks indicating the presence of WO₃ and WO₂, despite excess Mg used. The presence of Cr₂O₃ together with WO₃ modifies the reaction kinetics and improves the final yield. A distinct shift of the diffraction peaks when Cr is increased is attributed to a greater amount of Cr within the W lattice. An imperfect mixing of the two elements is suspected for WCr₄ and WCr₆, as distinct shoulders are visible to the right of the peaks. The study examines the microstructure of WCr₆ samples sintered at 2000°C for 5', revealing a grain size range of 5-10 μm .

Conclusions :-

Magnesium-thermitic reactions were used to synthesize tungsten-chromium alloys with nanometric to submicronic powders. Densification using SPS resulted in a final density of up to 99.9%, preserving the nanometric substructure of grains. The aim was to increase mechanical properties, specifically ductility. Compressive testing showed an elastic limit of 700 to 1000 MPa and ductility greater than 9%. Future research will focus on more complex alloys with 2-3 alloying elements to improve mechanical properties and recrystallization resistance.

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- [2] Bolt, H.; Barabash, V.; Krauss, W.; Linke, J.; Neu, R.; Suzuki, S.; Yoshida, N.; Team, A.U. Materials for the plasma-facing components of fusion reactors. J. Nucl. Mater. 2004, 329–333, 66–73. [Google Scholar][Green Version]

Cu₂ZnSnS₄ solar cells with over 10% power Conversion efficiency enabled by heterojunction Heat treatment

ABSTRACT:-

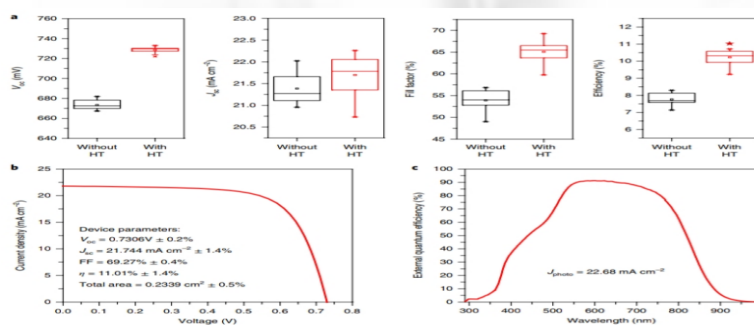
Sulfide kieserite Cu₂ZnSnS₄ provides an attractive low-cost, environmentally benign and stable photovoltaic material, yet the record power conversion efficiency for such solar cells has been stagnant at around 9% for years. Severe non-radiative recombination the heterojunction region is a major cause limiting voltage output and overall performance. Here we report a certified 11% efficiency Cu₂ZnSnS₄ solar cell with a high 730 mV open-circuit voltage using heat treatment to reduce heterojunction recombination. This heat treatment facilitates elemental inter-diffusion, directly inducing Cd atoms to occupy Zn or Cu lattice sites, and promotes an accumulation accompanied by local Cu deficiency within the heterojunction. Consequently, new phases are formed near the hetero-interface and more favourable conduction band alignment is obtained, contributing to Reduced non-radiative recombination. Using this approach, we also demonstrate a certified centimetre-scale (1.11 cm²) 10% Efficiency Cu₂ZnSnS₄ photovoltaic device; the first kieserite cell (including selenium-containing) of standard centimetre-size To exceed 10%.

Keywords:-Cu₂ZnSnS₄, solar cell, photovoltaic device, heterojunction

INTRODUCTION:-

The large and long-term future deployment of photovoltaics demands stable, abundant, non-toxic materials similar To silicon. Pure sulphide kieserite Cu₂ZnSnS₄ (CZTS), a quaternary compound semiconductor, has emerged as an excellent Candidate for such next-generation photovoltaic technology. It has attracted attention due to its non-toxicity, high efficiency and low-cost potential. These are both known for their favourable optical and electronic Properties and demonstrated >22% efficiency, suggesting a high efficiency potential for caseterite. In addition to the use of low-cost, abundant materials, most reported efficient CZTS solar cells have been produced using industrially viable sputtering methods developed for CIGSe, which will facilitate upscaling this technology for future commercialization. Photovoltaic devices fabricated from the absorber CZTS are Among the most efficient of the Earth-abundant, non-toxic thin film Solar cells under investigation at present. The bandgap of

CZTS is 1.5 eV, close to the optimal bandgap required for a single junction Solar cell. More importantly, the bandgap of CZTS can be easily tuned in a wide range (1.5~2.1 eV) when alloying with other elements such as Ge or Ag, making it well matched to the high band-Gap requirement for the uppermost cells for Si-based tandem cell Stacks.



DEVICE PERFORMANCE :-

The baseline process for fabricating CZTS solar cells is based on two Key steps: co-sputter deposition of Cu/SnS/ZnS precursor followed By a high-temperature sulfurization annealing. Additional refinements were ultra-thin Al₂O₃ layers, which were deposited prior to the absorber precursor deposition and sulfurization annealing That was conducted in a combined SnS plus S atmosphere, yielding CZTS solar cells of around 8% baseline efficiency. The heat treatment (HT) processes were performed immediately after The chemical bath deposition (CBD) of CdS on top of the CZTS Absorber. We tried a wide range of processing temperatures, from 200 °C to 500 °C. Treatment at temperatures around 300 °C gave the best and most reproducible performance results and was therefore favoured for comprehensive analysis. The traditional CdS heterostructure for CIGS and CZTS was used, with full details presented In the methods section.

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TECHNO RIDE

- By Nihar Ravindra Huprikar (210130121504)

THE BRIEF HISTORY OF HUMAN PSYCHOLOGY

ABSTRACT:

The perks of reading a lots of books based on human psychology will get you more understanding on how people around you behave and which traits leads to which consequences it wasn't the first time in history where people started understanding as it started around the Greek civilisation which was being flourished. By reading the article one can understand how deeply thoughts can matter and how one can create the idea of critical thinking.

(Keywords: human psychology, Greek civilisation, deeply thoughts, critical thinking)

INTRODUCTION:

The origins of the study of the psychology of human thought can be traced to two distinct approaches to the understanding of human behavior: philosophy and physiology. Today, these two fields of inquiry are viewed almost as dialectically opposed. That is, philosophy is often viewed as involving speculative methods and physiology as involving empirical, largely scientific methods. But in ancient Greek times, many physiologists as well as philosophers believed that truth could be reached without the benefit of empirical methods.

As time went on, philosophy and physiology diverged more and more, with physiologists seeking out empirical methods that never interested philosophers. As time went on, several dialectics kept arising and re-arising in the study of the human mind—whether the mind and body are one entity or distinct entities; whether the mind is best understood through rationalistic or empirical methods; whether abilities are genetically or environmentally determined. The synthesis stage of each dialectic involved the recognition that the two positions are not necessarily opposed to each other—the ideas could be integrated. For example, abilities almost certainly have both genetically and environmentally influenced components, as well as a component influenced by the interaction between genes and environment.

Intermediate Periods in the Western History of Understanding Human Thought:

During the early Christian era (200–450 C.E.) and the Middle Ages (400–1300 C.E.), rationalism and empiricism became subsidiary to the primacy of religious faith. Neither method was viewed as valid unless it demonstrated what was already “known” to be true on the basis of Christian doctrine. (Other views evolved in Eastern countries, but because modern psychological science is largely based on the Western tradition. This kind of logic—which is perhaps as prevalent today as in the past, just in different forms—shows the fallacy of confirmation bias, whereby we seek out information that is consistent with what we believe and ignore or reject information that is not consistent with our beliefs. More and more today, through social media and other means, people only read news feeds and websites that present views that correspond to those the individual already has. Modern views of science were born during the period of the Renaissance, roughly from the 1300s to the 1600s. The modern period of the psychology of human thought can be seen as beginning with structuralism, which sought to understand the structure (configuration of elements) of the mind by analyzing the mind in terms of its constituent components or contents. At the time structuralism was introduced, scientists in other fields also were trying to understand constituents, such as the periodic table of elements and the biochemical constituents of cells. Thus, structuralism was a part of a large movement in science to break things down into their basic elements. Wundt believed that people could be trained to be experts at introspection, so that they would report exactly what they sensed without the mediation of their knowledge of concepts and categories (such as tree or maple)[1].

School of Thought	Main Emphasis
Structuralism	Analysis of thought into constituent components
Functionalism and pragmatism	Understanding “why” of behavior; practical uses of thought and behavior
Associationism	Study of mental connections between stimuli and responses
Behaviorism	Study of observable behavior and how rewards determine behavior
Gestaltism	Study of thought and behavior as holistic, not just as a sum of parts
Cognitivism	Understanding the mental processes and representations underlying thought

Table 1 Main Schools of Thought in the History of the Psychology of Thought[1].

Reference:

[1] &NA;, *The Psychology of Human Emotions*, vol. 13, no. 6. 1992. doi: 10.1097/00004703-199212000-00013.

ABSTRACT:-

This article presents a general overview of recent advances in developing smart textiles Through application of nanostructured materials. It focuses on different synthesis approaches Of nanoparticles, immobilization methods, and coating techniques reported in the literature. Different techniques of treating fabric surfaces, including sol-gel, cross-linking, plasma and Nanocomposite coating methods, are explored. In addition, the application of different types of Nanoparticles in textile modification processes along with the resultant functionalities such as Self-cleaning, UV protection, thermal regulation, antimicrobial activity, fire retardancy, and Conductivity as well as associated mechanisms are discussed.

Keywords: nanoparticles, coating, smart textiles, sol-gel

INTRODUCTION :-

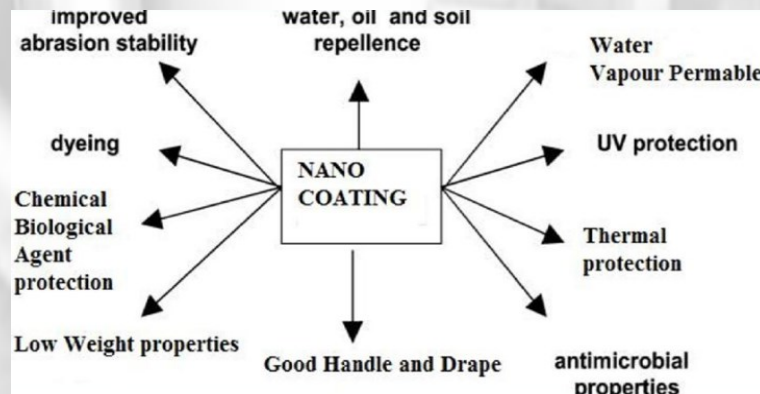
The concept of textiles coating dates back to antiquity era. The simplest coating process was Born when our primary ancestors realized that they could get waterproofing features on their Outfits by simply smearing the animal fats on clothes. Since then, the humans have always been Trying to introduce novel materials to textiles by coating . The main objective of the finishing Process in the textile industry is adding or improving the functions of current textile-based Products or introducing new properties to the substrate. The application of numerous materials, Chemicals and methods to coat the fabrics has led to introduction of many new products in the Market with novel features. Finishing, coating, and laminating processes cover various fields, Aspects and contexts in the textile industry, each of which warrants its own technical Prerequisites, knowledge, expertise and equipment.



FABRICATION METHOD OF NANOCOATINGS SOL-GEL NANOCOATING

The main idea behind using the sol-gel method is creating an inorganic or organic network From a colloidal solutions synthesized from precursors . The sol in general is defined as a Stable suspension of metal oxide particles in a liquid medium. In a colloidal sol, the sizes of Dispersed particles are too small in a way that the gravity force on them is negligible and the Van der Waals forces and surface chemistry are influential parameters . The gel is an Interconnected porous 3D rigid networks of suspended matters in the sol which are developed Throughout the liquid medium.

The gel is an Interconnected porous 3D rigid networks of suspended matters in the sol which are developed Throughout the liquid medium.



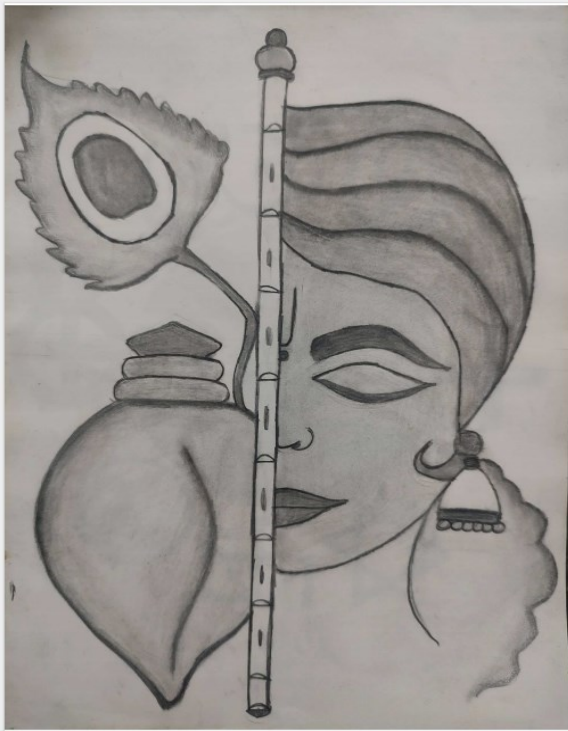
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[1] Gashti MP, Pakdel E, Alimohammadi F. Nanotechnology-based coating techniques for smart Textiles. In: Active coatings for smart textiles, Hu J (Ed.), p. 243-68, Woodhead Publishing, 2016

ART GALLERY

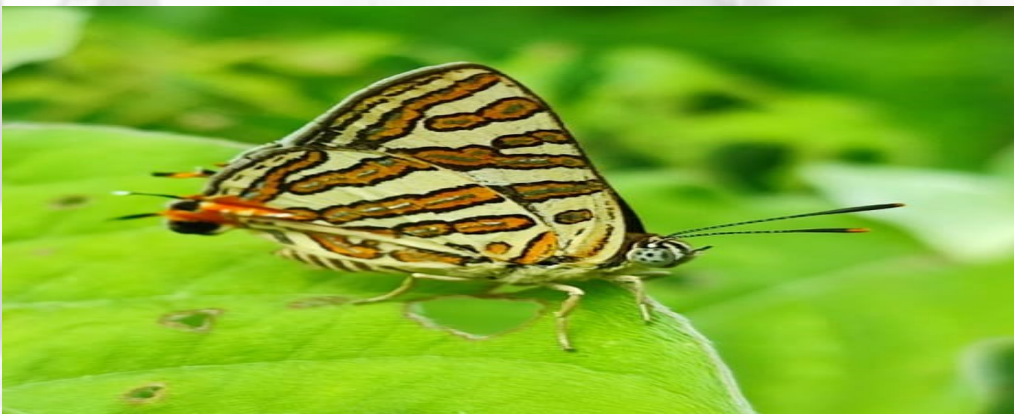
SKETCHES

By :- Mr Kelvin Vikani (200130121001)



PHOTOGRAPHY

By :- Mr Nihar Huprikar (210130121504)



ART GALLERY

The stretch Marks are battle scars
They are proof that it wasn't smooth
And that giving birth to a baby Is painful yet pure...
It stains the body But washes the soul
And if being a mother
Means one thing It means sacrifice Perhaps the
children One day...
They will understand
All the sacrifices
She gladly made
Out of love for them
Mothers says to her children
These shadows of mine
Are comprised in you Since we have met
It has so happened as if some unheard wish or
prayer has been fulfilled.
This is the short poem that anyone would love to
share to their moms.
And last line of this poem....
Is a reply of child to her mother that if I am here,
you are somewhere here too..
I can only say that how did I find you??
I cannot believe my luck. I am so blessed to have
such a beautiful, kind soul as
my mother...

-Written by Miss. Shibbu Singh
(210130121009)



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