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GOVERNMENT ENGINEERING COLLEGE

GANDHINAGAR

॥ कर्ममयं ज्ञानं एवं ज्ञानमयं कर्म ॥

STUDENTS' SOCIETY OF METALLURGY ENGINEERING GANDHINAGAR

SSMEG

ESTD-2012

Regd.No. GUJ/2051/Gandhinagar

NEWSLETTER

METALLURGY DEPARTMENT

(NBA ACCREDITED 2025-28)

JANUARY 2025 to JUNE 2025

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

File No. 20-78-2013-NBA **Date 05-06-2025**

To

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

Subject: Further accreditation status on the basis of Compliance Report of the program in Tier-II applied by Government Engineering College, Gandhinagar Nr. G.E.B. Cross Road, Sector - 28, Gandhinagar –Gujarat- 382028.

Sir,

This is regarding Compliance Report submitted by **Government Engineering College, Gandhinagar Nr. G.E.B. Cross Road, Sector - 28, Gandhinagar –Gujarat- 382028** for the UG Metallurgy program which was accredited by National Board of Accreditation (NBA) in Tier-II for academic years 2022-23 to 2024-25 i.e. upto 30/06/2025.

2. An Expert Team conducted data verification of the program on **13th April,2025**. 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 2025-2026 to 2027-2028 i.e. upto 30-06-2028	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 further 3 years. **Government Engineering College, Gandhinagar Nr. G.E.B. Cross Road, Sector - 28, Gandhinagar –Gujarat- 382028** should submit fresh online application through eNBA portal not before five months from the expiry of validity of accreditation mentioned above.

Contd./_

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

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.

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 of the Report of the Visiting Team in respect of the above program is enclosed.

Yours faithfully,

(Dr. Anil Kumar Nassa)
Member Secretary

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, Computer, Electronics & Communication, Instrumentation & Control, Information Technology 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.

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 (Met. & Mat. Engg.)	Professor & Head
2	Dr. D. G. Sharma	Ph.D (Metallurgy)	Associate Professor
3	Dr. H. H. Jadav	Ph.D (Metallurgy)	Associate Professor
4	Prof. S. I. Patel	ME (Met. & Mat. Engg.)	Assistant Professor
5	Dr. P. K. Nanavati	Ph.D (Met. & Mat. Engg.)	Assistant Professor
6	Dr. D. V. Mahant	Ph.D (Met. & Mat. Engg.)	Assistant Professor
7	Prof. B. R. Rana	ME (Met. & Mat. Engg.)	Assistant Professor
8	Dr. H. H. Thakar	Ph.D (Metallurgy)	Assistant Professor
9	Prof. R. C. Ghanghas	ME (Met. & Mat. Engg.)	Assistant Professor

INDEX

ACHIVEMENTS OF THE FACULTIES

Dr. I. B. Dave published research papers in reputed journal (Details are given in Research activities)

Dr. I. B. Dave successfully completed 12 weeks NPTEL MOOC Course on "Education for sustainable development" with Gold Elite certification during Jan-Apr 2025

Industry-Academia Connect - visited K P Tech Engineering foundry on 26/04/ 2025

Industry-Academia Connect - visited AIA center of foundry training at GTU -ITR , near Mehsana 19/05/2025

Dr. D. G. Sharma was promoted to Associate Professor (Metallurgy)

Dr. D. G. Sharma published/presented research papers in reputed journal/ conference (Details are given in Research activities)

Successfully completed 12 weeks NPTEL MOOC Course on "Education for Sustainable Development" with 1% Topper - Gold Elite certification during Jan-Apr 2025.

Industry-Academia Connect - visited AIA center of foundry training at GTU -ITR , near Mehsana 19/05/2025

Coordinated Blood Donation Camp and Thalassemia Test Camp 2025 held on 4th March 2025 at GEC Gandhinagar.

Organizing committee member of One day workshop on Corrosion Control & Monitoring (CCM)- 2025 cum Launching of the AMPP Gujarat Chapter organized By AMPP Gujarat Chapter & The IIM Baroda Chapter on 24/04/2025.

Reviewed paper for international peer review journal "Welding International" from Taylor & Francis

Contributed as Food Committee Coordinator for State Level Placement Fair Zone-1 Node-2, 20/03/2025 at GEC Gandhinagar

Attended and organized various expert lectures (Details are given in Expert talks and certificates by faculties)

ACHIVEMENTS OF THE FACULTIES

Dr. H H Jadav was promoted to Associate Professor (Metallurgy)

Successfully completed 12 weeks NPTEL MOOC Course on "Education for sustainable development" with Gold Elite certification during Jan-Apr 2025

Organized industrial visit for demonstration of NDT to Mr. Nitin Raval (Proprietor) of Ultratech, Ahmedabad, on 05/04/2025 along sem 4 & 6 students.

Attended and organized various expert lectures (Details are given in Expert talks and certificates by faculties)

Prof. S I Patel Successfully completed 12 weeks NPTEL MOOC Course on "Basics of Language Sciences" during Jan-Apr 2025.

Industry-Academia Connect - visited SAC– ISRO, Ahmedabad for potential academic collaboration on 21/05/2025

Dr. P K Nanavati delivered two technical sessions-"Weldability & Welding Metallurgy of Steels" and "Destructive Testing of the Welded Joints" on 22/05/2025 as a part of IIW WIC 2025 Program held at IIW Baroda Branch

Delivered talk on "Materials of Construction (MoC) in fertilizer and chemical industries & "Welding Behaviour of SS-316L (Urea Grade) and 2RE69". At GNFC, Bharuch Gujarat on 25/01/2025 organized & invited by TCR Evolve, Baroda.

Delivered expert talk on " Crack the code-The Metallurgy behind the stronger stainless steel welds" in Welding Workshop series at GSSE 2025 (Global Stainless Steel Expo) held at Bombay Convention & Exhibition Centre-NASCO, Goregaon, Mumbai on 05/06/2025.

Attended and organized various expert lectures (Details are given in Expert talks and certificates by faculties)

ACHIVEMENTS OF THE FACULTIES

Dr. D V Mahant successfully completed 12 weeks NPTEL MOOC Course on "Education for Sustainable Development" with 1% Topper - Gold Elite certification during Jan-Apr 2025.

Industry-Academia Connect - visited K P Tech Engineering foundry on 26th April 2025.

Organized industrial visit for demonstration of NDT to Mr. Nitin Raval (Proprietor) of Ultratech, Ahmedabad, on 05/04/2025 along sem 4 & 6 students.

Attended and organized various expert lectures (Details are given in Expert talks and certificates by faculties)

Dr. H H Thakar completed 2 week industrial training at KPIL, Gandhinagar during 02/06/2025 to 14/06/2025.

Successfully completed 12 weeks NPTEL MOOC Course on "Education for sustainable development" with Gold Elite certification during Jan-Apr 2025

Received special appreciation from Principal and HOD for successfully organizing One Week Webinar series on Material Science & Metallurgy 2025

Contributed for organizing institute Alumni meet-2025 on 27/02/2025.

Contributed for registration and portal monitoring activities for Mega Placement Camp organized at GEC Gandhinagar during 20/03/2025.

Received special appreciation from Jt CEO KCG for planning and implementation of Mega placement camps in all districts of Gujarat during Feb-Mar 2025".

Industry-Academia Connect - visited KPIL for placement opportunities at Gandhinagar on 02/06/2025

Attended and organized various expert lectures (Details are given in Expert talks and certificates by faculties)

Prof. R C Ghanghas successfully completed 12 weeks NPTEL MOOC Course on "Education for sustainable development" with Gold Elite certification during Jan-Apr 2025

Received special appreciation from Principal and HOD for successfully organizing one week webinar series on Material Science & Metallurgy 2025

Contributed for organizing institute Alumni meet-2025 on 27/02/2025.

Coordinated the Finance, account and billing committee for Mega Placement Camp organized at GEC Gandhinagar on 20/03/2025.

Attended and organized various expert lectures (Details are given in Expert talks and certificates by faculties)

PEDAGOGY SESSION

sr. no	Name of the speaker	Department	Topic delivered	Date
1	Dr. I. B. Dave	Professor & Head Metallurgy	"Decision making - Important for Leaders"	04/03/2025

GLIMPSES OF EXPERT LECTURE

Sr. no	Date	Expert Details	Topic	Coordinators
1	06/03/2025	**Ms. Neelam J. Sompura** Lecturer in metallurgy dept., govt. polytechnic, Rajkot	Strengthening Mechanism for metals	Prof. R. C. Ghanghas, Prof. R. H. Patel
2	07/03/2025	**Dr. V. D. Patel** Asst. Professor Government Engineering College, Palanpur	Non Dimensional Numbers the Mystery Of fluid mechanics	Prof. K. P. Patel, Dr. H. H. Jadav
3	10/03/2025	**Dr. Mrunalkumar Chaudari** Asst. Prof. (metallurgy) Mechanical Engineering L D College of Engineering	Construction of phase diagram and use of phase diagram	Dr. D. G. Sharma, Dr. D. V. Mahant
4	11/03/2025	**Dr. Mandar Joshi** Lecturer (metallurgy) Dr. S & S S Ghandhy College of engineering & Technology Surat	Nanomaterials and composites	Dr. D. G. Sharma, Prof. V. N. Patni
5	18/03/2025	**Dr. Vishwesh Badheka** Prof. Mechanical Engineering, PDEU	Exploring the future of manufacturing, Live Demonstration &	Dr. Purvesh Nanavati, Dr. Dixit Patel

1. On 6th march, an expert talk was conducted on strengthening mechanism for metals for the students of semeter4 and 6 of metallurgical and mechanical engineering branches, from 3:15 PM to 5:15 PM, delivered by Ms. Neelam J. Sompura, and smoothly coordinated by Prof. R. C. Ghanghas and Prof. R. H. Patel. Around 75 students benefitted from the session, which highlighted methods to enhance the strength of metals and alloys for engineering applications.

2. An expert talk was delivered by Dr. V. D. Patel, Assistant Professor, Mechanical Engineering Department, GEC Palanpur, on "Non-Dimensional Numbers: The Mystery of Fluid Mechanics" for 4th and 6th semester students of Mechanical and Metallurgy Department, GEC Gandhinagar, on 07th March 2025. A total of 42 students participated and benefited from the session. The session was coordinated by the by Dr. H. H, Jadav and Prof. K. P. Patel

3. On 10th march 2025 an offline expert talk on "Construction of Phase Diagram" and "Use of Phase Diagram" was held by **Dr. Mrunalkumar Chaudari** for 4th and 6th semester Metallurgy students at GEC, Gandhinagar. The morning session started from 10:30 AM to 12:30 Pm and the other session started from 1:00 PM to 3:00 PM. A total of 18 students benefited from the session, which focused on the construction and application of phase diagrams in Metallurgical Engineering.

4. An online expert lecture on "Nano Materials and Composites" was jointly organized on 11th March 2025 by the Metallurgy and Mechanical Engineering Departments, IIM Baroda Chapter, and SSMEG at GEC, Gandhinagar.. The session was delivered by Dr. Mandar Joshi, Lecturer (Metallurgy), Dr. S & S S Ghandhy College of Engineering & Technology, Surat, for BE Metallurgy and Mechanical students.. A total of 67 students and 10 faculty members attended and benefited from insights on the unique properties and wide applications of nanomaterials and nanocomposites.

5. On 18th March 2025, around 25 third-year students from the Mechanical and Metallurgy departments of Government Engineering College, Gandhinagar, along with two faculty members, participated in a one-day visit to PDEU, Raisan. During the visit, they attended an expert talk on Additive Manufacturing Processes and Their Applications delivered by Dr. V. J. Bhadeka (Ph.D. in Metallurgy), who provided valuable insights into the topic with great precision.

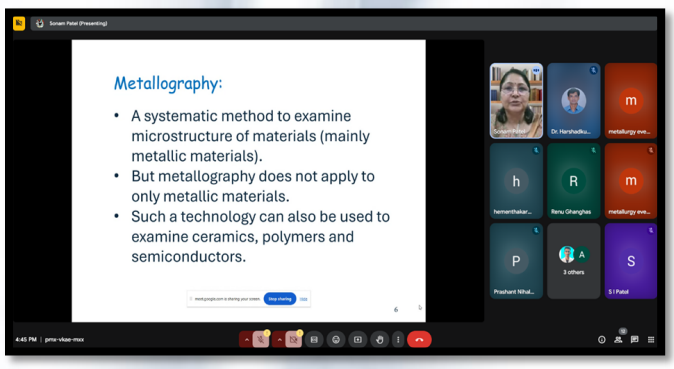
GLIMPSES OF "WEBINAR SERIES"

Sr. No.	Date	Expert Details	Topic
1	21/04/2025	**Dr. Vidhi Mistry** Lecturer, Metallurgy, L. E. College, Morbi (Diploma)	**Electrochemistry in Action: The Hidden World of Corrosion**
2	22/04/2025	**Dr. Sonam Patel** Lecturer, Metallurgy dept. S & S S Ghandhy Polytechnic, Surat	**Magnesium: The Metal That's Lighter, Stronger, and the Future!**
3	23/04/2025	**Dr. Minal Dani** OSD, GTU Skills, GTU Chandkheda	**Heat treatment of steels**
4	24/04/2025	**Dr. Riddhi Shukla** Early-Stage researcher, Tallinn Uni of Technology Estonia, Europe	**Non-ferrous physical metallurgy for TI/Cu/Al**
5	25/04/2025	**Mrs. B. H. Goyal** I/C Principal, Dr. S & S S Ghandhy Polytechnic, Surat	**Advanced Metallography and Microstructural Analysis**

Under the guidance of Dr. S. P. Dave, (Principal, GEC Gandhinagar), Metallurgy department, GEC Gandhinagar has organized one week webinar series on "Metallurgy and Material Science 2025,Women's Week Special" in association with alumni association Students Society of Metallurgy Engineers Gandhinagar during 21/04/2025 to 25/04/2025, 11:00 AM onwards.

This event was organized by Dr. H. H. Thakar and Prof. R. C. Ghanghas. Motive of this event was to give exposure to students and make them familiarize with various advancement and research in metallurgy by giving online expert lectures.

The webinar series was inaugurated on 21/04/2025 at 11:00 AM by Dr. I. B. Dave, HOD Metallurgy Dept. GEC Gandhinagar. More than 40 students attended the lectures collectively both online and of-fline . Online practical session and expert lectures were given on various topics of metallurgy during this event. The first lecture of the series was held offline by Dr. Vidhi Mistry and the lectures by Dr. sonam Patel, Dr. Minal Dani, Dr. Riddhi Shukla, Mrs. B. H. Goyal were all online

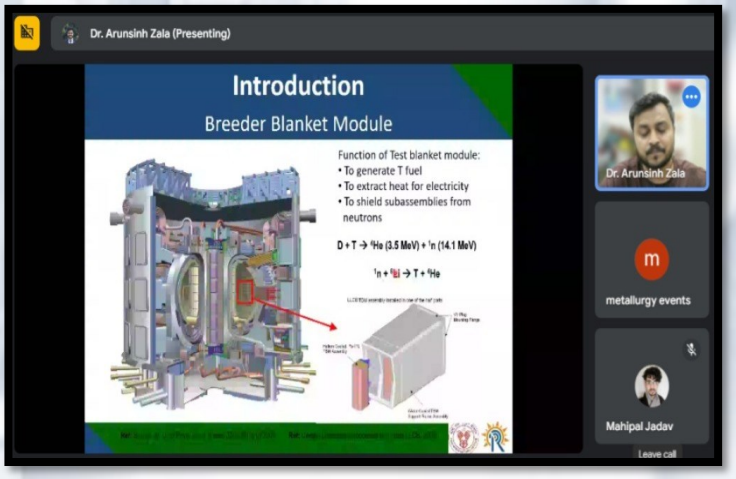


GLIMPSES OF "ALUMNI MEET 2025"

S.no	Date	Expert	Topic	Coordinators
1	27/02/2025	**Dr. Arunsinh Zala** Alumni student batch 2012 passout GEC, MET Dept, Senior research fellow at NSSE, NTU Singapore	**Aluminide coatings for Nuclear applications**	**Dr. H H Thakar, Prof. R C Ghanghas**

As a part of the Alumni Meet, an Expert Session was conducted by Dr. Arunsinh Zala, an alumnus from the 2012 batch of the Metallurgical Engineering Department, Government Engineering College, Gandhinagar. Currently serving as a Senior Research Fellow at NSSE, NTU Singapore, Dr. Zala delivered an insightful online session on "Aluminide Coatings for Nuclear Applications" on 27th February 2025. The meeting started at 11:00 am with welcome note by Prof. R. C. Ghanghas. then Dr. Zala offering students crucial insights into technical advancements and career opportunities in nuclear technology. The event was enjoyable and simultaneously profitable in terms of providing career as well as technical guidance to the current enrolled students of Metallurgy and Mechanical Engineering departments.

Towards the end, Prof. R. C. Ghanghas delivered a heartfelt vote of thanks to the Principal, Dr. I. B. Dave, and the Head of Department for their support. Special appreciation was extended to student members of SSMEG for their assistance, as well as to all faculty members, students, and alumni for making the event a success.
The session was wonderfully coordinated by Dr. H. H. Thakar and Prof. R. C. Ghanghas



"STUDENT ACTIVITES"

1. 75TH NIRVAN DIVAS OF MAHTMA GANDHI

Date: 30/01/2025

Location: Block no 08, metallurgy department, GECG

On the 30th of January at 11:30 AM, the students and faculty of the metallurgy department observed a two minutes of silence to mark the 75th Nirvana divas, made a silence tribute to honor the memory of the father of the nation and reflect upon his teachings and invaluable contributions to the Country .

2. BIMSTEC Youth Summit 2025

Date: 08/02/2025

Location: The Mahatma Mandir Convention and Exhibition Centre, sector 13, gandhinagar

Students from Semester 4 and 6 of the Metallurgical Engineering Department, GEC Gandhinagar, participated in the BIMSTEC Youth Summit held on 8th February 2025. Organized by the Department of Youth Affairs, Ministry of Youth Affairs & Sports, Government of India, the summit aimed to strengthen ties among the youth of Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand. The event focused on youth-led initiatives, leadership, and Sustainable Development Goals (SDGs), offering students a platform for learning, collaboration, and global engagement.

"STUDENT ACTIVITES"

3. Gujarat SemiConnect Conference 2025

Date: 05/03/2025

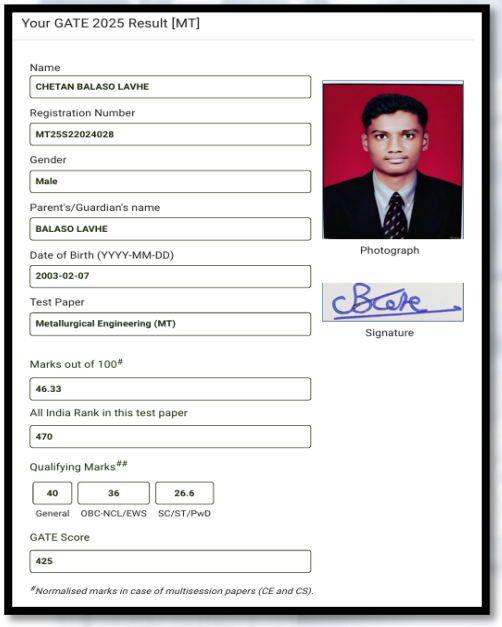
Location: The Mahatma Mandir Convention and Exhibition Centre, sector 13, gandhinagar

Students from Semester 4 and 6 of the Metallurgical Engineering Department attended the Gujarat SemiConnect Conference 2025 on 5th March at the Mahatma Mandir Convention and Exhibition Centre, Gandhinagar. Inaugurated by Chief Minister Bhupendra Patel and Union IT Minister Ashwini Vaishnaw, the event featured over 250 exhibitors from the semiconductor industry who shared cutting-edge innovations and insights, offering students a valuable learning experience and a glimpse into the future of electronics and materials technology.

STUDENT ACHIEVEMENTS

1. Raghav Deshpande, (220133121007) received an award by the honourable chief minister of Gujarat, Shri Bhupendra Patel for heritage place photography

2. It was a proud moment for Metallurgy department GEC Gandhinagar as final year student Mr. Rahul Yadav (2023 passout) has been awarded Gold Medal by GTU at 14th annual convocation held on 28/01/2025



Your GATE 2025 Result [MT]

Name
CHETAN BALASO LAVHE

Registration Number
MT25S22024028

Gender
Male

Parent's/Guardian's name
BALASO LAVHE

Date of Birth (YYYY-MM-DD)
2003-02-07

Test Paper
Metallurgical Engineering (MT)

Photograph

Signature

Marks out of 100#
46.33

All India Rank in this test paper
470

Qualifying Marks##

General	OBC-NCL/EWS	SC/ST/PwD
40	36	26.6

GATE Score
425

#Normalised marks in case of multisession papers (CE and CS).

3. Chetan Lavhe (210130121513) from the Metallurgy Department secured an impressive AIR 470 in GATE 2025 (Metallurgical Engineering) with a GATE score of 425, bringing great pride to the department.

TECHNICAL/ INDUSTRIAL VISIT

1 NDT TRAINING

Location: Ultra Tech NDT Training, Bapunagar, Ahmedabad

Date and Time: 05/04/2025, 11AM onwards

On 5th April 2025, a group of 17 students from the 4th and 6th semesters of the Metallurgy Engineering Department at Government Engineering College, Gandhinagar, visited Ultra Tech NDT Training, Evaluation, and Consultant in Bapunagar, Ahmedabad. The visit aimed to provide students with valuable insights into the Non-Destructive Testing (NDT) methods, which are vital in various industries, especially in materials engineering. The primary focus of the visit was to introduce and demonstrate four key NDT methods: Liquid Penetrant Testing (LPT), Magnetic Particle Testing (MPT), Ultrasonic Testing (UT), and Radiographic Testing (RT).

TECHNICAL/ INDUSTRIAL VISIT

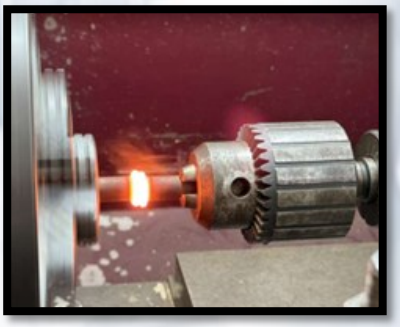
2. ONE DAY VISIT TO PDEU

Location: Pandit Deendayal Energy University , Raisan, Gandhinagar

Date:- 18th March 2025 , 9:30 to 5 : 30 p.m.

One Day Visit to PDEU, Raisan, Gandhinagar to Advanced Manufacturing Process Lab and Attending Expert Talk. The IIW-PDEU Welding Research and Development Centre in collaboration with IIW-Ahmedabad Centre and IIW-PDEU students chapter, organized a One-day workshop on Advanced Manufacturing. Workshop was attended by 25+ Third year Mechanical and Metallurgical Engineering students of Government Engineering College, Gandhinagar along with two faculty.

The Workshop included an expert talk and demonstrations in the metal additive manufacturing lab at PDEU. The visit covered both theoretical and practical aspects of Additive Manufacturing and Advanced Welding. The were Demonstrated various manufacturing processes like- Laser powder bed fusion and Material extrusion, Friction welding, Friction stir welding, Laser welding, Laser cleaning, Resistance spot & projection welding, Air plasma cutting & EDM Wire cut, Stir casting.
It was an excellent opportunity to showcase advanced manufacturing capabilities of PDEU and an exciting opportunity for the students to enrich their minds with various manufacturing and advanced welding techniques.



RESEARCH ACTIVITIES

Research Paper Counter (Jan 2019 onwards)	Previously published	Addition	Total
	58	6	64

Sr. No.	Title of the paper	Authors	Publication/ Conference
1	Study the Electrochemical Behaviour Of al-mg-si Alloy - Review	Tushal K. Kyada, Indravadan B. Dave, Sonam M. Patel	Journal of The Maharaja Sayajirao University of Baroda Science & Technology
2	Microstructure and Corrosion Behavior of AL Al-Mg-Si Alloy as a sacrificial Anode	Tushal K. Kyada, Indravadan B. Dave, Sonam M. Patel	Journal of The Maharaja Sayajirao University of Baroda Science & Technology
3	Analysing Hydrogen Embrittlement Challenge for Hydrogen storage & Its utilization in Industries	Daulat kumara Sharma, Sarvesh Gurram, Rahul Yadav, Chirayu Pande	Journal of The Maharaja Sayajirao University of Baroda Science & Technology
4	Comparing Thermal Spray Coating Characteristics using Al, Zn Alloy by Arc and Flame Spray Process to optimized the coating performance	Urvesh Vala and I. B. Dave	Journal of The Maharaja Sayajirao University of Baroda Science & Technology
5	Study of Arc and Flame spray Thermal spray coating corrosion characterization for upstream and downstream refineries application	Urvesh Vala and I. B. Dave	Journal of The Maharaja Sayajirao University of Baroda Science & Technology
6	Review on effect of Graphene Nano platelets on Magnesium alloys	Shaikh M. Arsh, Shafiq Raza, Jaahanvi Dave, Kelvin Vikani, Daulat Kumar Sharma, Harshadkumar H. Jadav	International conference on Recent advances in Mechanical Infrastructure (ICRAM-2025)

INDUSTRY-ACADEMIA CONNECT

1. Visit to AIA-Centre of Foundry Training at GTU-ITR

Date: 19/05/2025

Location: GTU-ITR, Mevad, Mehsana, Gujarat

Dr. I. B. Dave and Dr. D. G. Sharma visited the AIA-Centre of Foundry Training at Gujarat Technological University - Institute of Technology and Research (GTU-ITR), near Mevad, Mehsana, Gujarat, on 19/05/2025. The primary objective of the visit was to assess the facilities, infrastructure, and ongoing academic and industrial training activities at the AIA-Centre of Foundry Training under GTU-ITR, and to explore opportunities for collaboration and academic enrichment.
Dr. I. B. Dave and Dr. D. G. Sharma were warmly welcomed by the Principal and faculty members of GTU-ITR. A guided tour of the Foundry Training Center was conducted along with the Principal and faculty. The facility is well-equipped with modern foundry equipment, including induction furnaces, molding machines, and a sand testing laboratory. Ongoing student training programs were also observed. The integration of practical skill-building with academic learning was highly appreciated. Discussions were held regarding curriculum development, student involvement, and the potential for collaborative initiatives in the field of foundry technology. The visit proved to be highly informative and fruitful.

2. Visit to SAC

Date: 21/05/2025

Location: Space Applications Centre (SAC), ISRO

Prof. S. I. Patel visited the Space Applications Centre (SAC), ISRO, on 21/05/2025. It provided an excellent opportunity to explore potential academic collaborations and understand the role of SAC in national space missions.

3. Industry-Academia Connect

Date: 26/04/2025

Location:

As a part of Industry-Academia initiative, Dr. I. B. Dave and Dr. D. V. Mahant, visited K P tech Engineering Foundry on 26/04/2025. The visit was aimed to explore potential areas of academic collaborations and opportunities and to gain deeper knowledge on current industrial trends, various insightful discussions were held as a part of the visit.

4. Industry-Academia Connect

Date: 02/06/2025

Location:

As a part of Industry-Academia initiative, Dr. H. H. Thakar, visited Kalpataru Projects International Ltd. on 02/06/2025. The visit was aimed to explore potential areas of academic collaborations, placement/internship opportunities and to gain deeper knowledge on current industrial trends, various insightful discussions were held as a part of the visit.

PLACEMENTS - 2025

@

METALLURGY DEPARTMENT,

(NBA ACCREDITED 2025-28)

GEC, GANDHINAGAR SECTOR - 28

Sr. No.	Name of Student	Name of Industry	Annual Package (INR)
1	Nayan Khante	Reliance Industries Ltd	700000
2	Arsh Shaikh	Adani Groups Ltd	650000
3	Deshpande Raghav Umesh	Bosch	450000
4	Prayag Raut	CMR Greens Ltd.	425000
5	Vijay vishwas Bachche	Saarloha Pvt. Ltd.	400000
6	Pratik Bhagwat Parkale	Saarloha Pvt. Ltd.	400000
7	Yash Janardan Shinde	Saarloha Pvt. Ltd.	400000
8	Shaikh Shafiq Raza	Hicon Technocast	360000
9	Dave Jahanvi	Hicon Technocast	360000
10	Tanmay yede	Jailaxmi Steels	360000
11	Shreyas Shripati Jamale	Jailaxmi Steels	360000
12	Aditya Shende	Jailaxmi Steels	360000
13	Amitkumar Gaygaye	Chandan Steels Ltd.	360000
14	Ovhal Viraj	Chandan Steels Ltd.	360000
15	Vikani Kelvin	Amcon Castings	300000
16	Arzoo Bhalodiya	Amcon Castings	300000
17	Shibbu Singh	Amcon Castings	300000
Average Package			**402647**

85 % ARE ALREADY PLACED..... AND ITS NOT OVER YET !

TRAINING/ACTIVITY ATTENDED BY FACULTY

Sr. no	Name of faculty	Title of Training/Activity	Duration	Organizer
1	Dr. I B Dave	Certificate of Participation in the Nurturing Future Leadership Program under Malaviya Mission at IIM Visakhapatnam	10/02/2025 to 14/02/2025	IIM Visakhapatnam,Department of Higher Education, Ministry of Education, Government of India
		Successfully completed the course "Education for Sustainable Development" with a score of 97%	20/01/2025 to 11/04/2025	NPTEL-AICTE
2	Dr. D G Sharma	Certificate of Appreciation for participating in "AI for Manufacturing"	17/01/2025	GTU, GCCI AHMEDABAD
		Successfully completed the FDP course "Education for Sustainable Development" with a score of 100%	20/01/2025 to 11/04/2025	NPTEL-AICTE
		Attended an Expert Talk on Introduction to GCSR leave and pension rules on at	18/01/2025	GEC Gandhinagar
		Attended an Expert Talk on Pay Fixation	25/02/2025	GEC Gandhinagar
		Attended online webinar on “Practising Theories of Psychology in Classroom” dated under the initiative TEERTH	25/04/2025	KCG, Education Department, Government of Gujarat
3	Dr. H H Jadav	Certificate of Appreciation for participating in "AI for Manufacturing"	17/01/2025	GTU, GCCI AHMEDABAD
		Successfully completed the course "Education for Sustainable Development" with a score of 97%	20/01/2025 to 11/04/2025	NPTEL-AICTE
4	Prof. S. I. Patel	Successfully completed the course "Basics of language Science" with a score of 68%	20/01/2025 to 11/04/2025	NPTEL-AICTE

TRAINING/ACTIVITY ATTENDED BY FACULTY

Sr. no	Name of faculty	Title of Training/Activity	Duration	Organizer
5	Dr. D V Mahant	Certificate of Appreciation for participating in "AI for Manufacturing"	17/01/2025	GTU, GCCI AHMEDABAD
		Successfully completed the course "Education for Sustainable Development" with a score of 100%	20/01/2025 to 11/04/2025	NPTEL-AICTE
6	Dr. H H Thakar	Successfully completed the course "Education for Sustainable Development" with a score of 99%	20/01/2025 to 11/04/2025	NPTEL-AICTE
		Appreciation for planning and implementation of Mega placement camps in all districts of Gujarat during Feb-Mar 2025	Feb-Mar 2025	KCG AHMEDABAD
7	Prof. R C Ghanghas	Certificate of Appreciation for participating in "AI for Manufacturing"	17/01/2025	GTU, GCCI AHMEDABAD
		Successfully completed the course "Education for Sustainable Development" with a score of 93%	20/01/2025 to 11/04/2025	NPTEL-AICTE
		Attended an Expert Talk on Pay Fixation	25/02/2025	GEC Gandhinagar

Nanotechnology: The Science of the Invisible

By Mr. Anuj gupta (220130121001)

Abstract

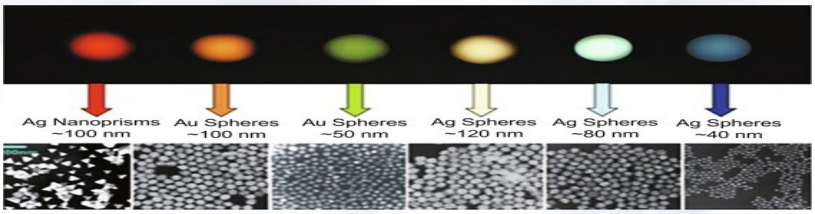
When we think of silver, we usually picture a shiny, grey metal used in jewelry, cutlery, or electronics. But at the nanoscale — between 1 and 100 nanometers — silver behaves very differently. Silver nanoparticles (Ag NPs) can appear bright yellow, vibrant red, or deep blue, depending purely on their size. This surprising behaviour is due phenomenon called Surface Plasmon Resonance (SPR). At such tiny dimensions, materials often display unique and unexpected properties compared to their bulk forms, opening exciting possibilities in fields like medicine, sensors, and electronics.

Introduction

Nanomaterials are materials intentionally engineered with at least one dimension between 1 and 100 nanometers. At this incredibly small size, the ratio of surface area to volume becomes significantly large, and quantum mechanical effects begin to dominate. As a result, properties we usually consider fixed — such as melting point, electrical conductivity, chemical reactivity, and optical behaviour — can change dramatically based simply on the material's size and shape.

The Phenomenon of Surface Plasmon Resonance (SPR)

The key to understanding the vibrant colours of silver nanoparticles lies in a phenomenon known as Localized Surface Plasmon Resonance (LSPR or SPR). Metals like silver have a "sea" of free conduction electrons. When light — an electromagnetic wave — strikes a metal nanoparticle smaller than the light's wavelength, it interacts with these free electrons. The oscillating electric field of light pushes the electrons, causing them to oscillate collectively. When the frequency of light matches the natural oscillation frequency of the electrons, resonance occurs, leading to strong absorption and scattering of light. The resonant frequency — and thus the colour — depends sensitively on the nanoparticle's size and shape:



- Small Silver Nanoparticles (10–40 nm): Resonance occurs with higher-energy (blue/violet) light, so solutions appear yellow (the complementary colour to blue).

- Larger Silver Nanoparticles (80–100 nm or more): Resonance shifts to lower-energy (green/yellow) light, so solutions appear red, purple, or blue. Very large particles or aggregates scatter light more broadly, making solutions look grey or brown.

Shape also matters. Nanorods, nanoprisms, and other structures shift SPR to different wavelengths, providing even more control over colour.

Applications of SPR

1. Biosensors: SPR is highly sensitive to changes in the nanoparticle's local environment. Molecular binding events can shift the resonance, enabling sensitive detection of biomolecules.
2. Stained Glass: Medieval artisans unknowingly used nanoparticles to create vibrant red and yellow stained glass, such as in the famous Lycurgus Cup.
3. Medical Diagnostics & Therapeutics: SPR is used for advanced imaging, targeted drug delivery, and cancer therapies.
4. Catalysis & Electronics: Enhanced electromagnetic fields around nanoparticles can improve catalytic reactions and boost performance in specialized electronic devices.

Conclusion

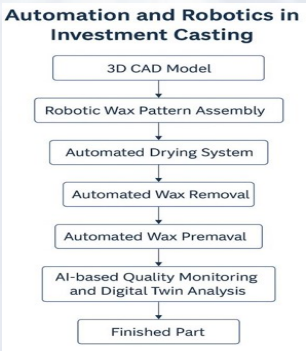
The ability of silver nanoparticles to display a rainbow of colours based purely on their size is a striking demonstration of how material properties transform at the nanoscale. By understanding and harnessing Surface Plasmon Resonance, scientists and engineers can design materials with precisely tailored optical properties, leading to innovations across fields such as medicine, sensing, catalysis, and electronics.

Advancements in Automation and Robotics in Investment Casting

By Mr. Vedant Tushar Chaudhary (240133121020)

Abstract
Investment casting, a process long valued for its ability to produce high-precision components, has evolved significantly with the integration of automation and robotics. These advancements have streamlined pattern assembly, shell building, material handling, and quality control, leading to higher efficiency, consistency, and safety. This article discusses recent technological developments, including the application of digital twins, AI, IoT, and robotics, highlighting how these innovations are transforming traditional investment casting processes into smart, automated systems.

Introduction
Investment casting, also known as lost-wax casting, has been a cornerstone of manufacturing for centuries, prized for its ability to produce complex shapes with excellent surface finishes. However, the traditional process is labor-intensive, time-consuming, and often subject to variability. The demands of modern industries — particularly aerospace, automotive, and medical sectors — for high precision, fast production rates, and stringent quality control have driven the need for technological innovation. The advent of automation and robotics has brought a paradigm shift to investment casting. By integrating intelligent systems, digital monitoring, and robotic operations, foundries can now achieve higher consistency, minimize human error, and significantly boost production efficiency. This paper explores the major advancements and their impact on the investment casting industry.



1. Automated Wax Pattern Assembly
Problem: Manual assembly leads to inconsistencies and damage to fragile patterns.
Advancement: Robotic arms precisely assemble wax trees with repeatable accuracy, enabling faster production and improved quality.

2. Robotic Shell Building
Problem: Uniform coating was difficult to achieve manually.
Advancement: Robots perform consistent dipping and stuccoing operations, leading to stronger, defect-free ceramic shells and reduced drying times.

3. Automated Material Handling
Problem: Manual transport can cause damage and delays.
Advancement: Automated conveyors and robotic handlers transport delicate patterns and shells with minimal risk, improving workflow efficiency.

4. Artificial Intelligence (AI) and IoT Integration
Problem: Reactive quality control processes.
Advancement: AI analyzes real-time data from IoT sensors, enabling predictive maintenance, early defect detection, and continuous process optimization.

Conclusion
The integration of automation and robotics into investment casting processes marks a major step toward Industry 4.0 adoption within foundries. These advancements not only enhance product quality and operational efficiency but also improve worker safety and reduce overall costs. As digital technologies such as AI, IoT, and digital twins continue to mature, the investment casting industry is set to become smarter, more responsive, and more sustainable. Future foundries will likely be highly automated ecosystems capable of producing increasingly complex components with minimal human intervention, redefining manufacturing excellence.

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4. 4. Align Manufacturing"Automation and Quality Control in Investment Casting" -Align MFG
5. 5. Journal of Manufacturing Processes"Integration of Robotics in Foundry Operations: A Review"(2022)Published by SME (Society of Manufacturing Engineers)
6. 6. Material Today: Proceedings"Advances in Al and IoT for Smart Foundry Applications"(2023)

Directional Recrystallization in 3D Printed Metals: Advancements and Techniques

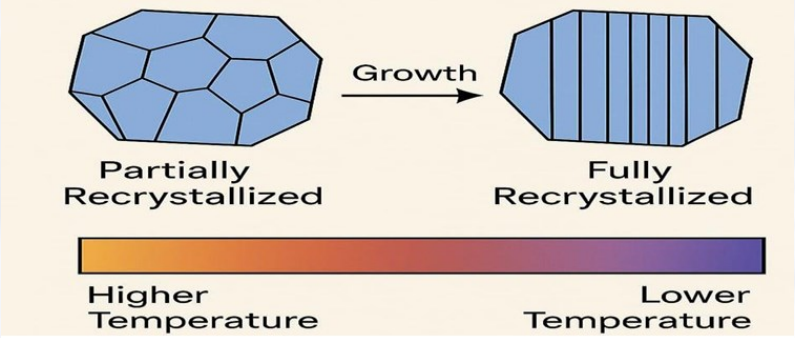
By Mr. Sairaj Aglave (240133121001)

Introduction

Additive manufacturing (AM), particularly metal 3D printing, has revolutionized material fabrication. However, challenges like anisotropic mechanical properties due to rapid solidification, complex thermal histories, and residual stresses persist. Directional recrystallization (DRX) has emerged as a promising post-processing technique to control grain orientation, reduce defects, and enhance mechanical performance.

Understanding Directional Recrystallization

Directional recrystallization involves selectively growing new, strain-free grains along a specific direction by applying a controlled thermal gradient. In 3D printed metals, the as-printed microstructure often consists of columnar grains aligned along the build direction, leading to anisotropy and reduced transverse mechanical properties. DRX aims to reorient these grains or replace them with equiaxed, texture-optimized grains, thereby improving ductility, toughness, fatigue resistance, and isotropy.



Recent Advancements

1. Thermal Gradient Engineering: Researchers have developed methods using laser or electron beam scanning to induce tailored thermal profiles, promoting directional recrystallization during or after printing.
2. In-situ DRX: Techniques such as thermal cycling during the layer-by-layer build process enable real-time microstructure refinement.
3. Post-processing Heat Treatments: Advanced furnaces equipped with directional cooling capabilities allow precise recrystallization without affecting the entire part.
4. Alloy Design: Custom alloys optimized for DRX behavior are under investigation.
5. Additive Manufacturing Process Optimization: Controlling scan speed, hatch spacing, and laser power preconditions microstructures for DRX.

Techniques for Directional Recrystallization

1. Laser Annealing: A focused laser beam selectively heats regions, guiding recrystallization fronts.
2. Electron Beam Healing: High-energy beams locally anneal defects and promote directional grain growth.
3. Hot Isostatic Pressing (HIP) with Thermal Biasing: Combines high pressure with a thermal gradient for DRX and porosity elimination.
4. Directional Solidification Followed by Recrystallization: Designs solidification structures for optimized recrystallization.
5. Induction Heating with Moving Coils: Establishes moving thermal gradients in large printed parts.

Conclusion

Directional recrystallization represents a significant advancement in tailoring the microstructure of 3D printed metals. By leveraging DRX, manufacturers can produce parts with superior mechanical properties, such as improved isotropy, fracture toughness, and resistance to fatigue and creep. Future research focuses on real time monitoring, computational modeling, and next-generation alloy development.

References

1. Kurzynowski, T., Gruber, K., Stopyra, W., Kuźnicka, B., & Chlebus, E. (2018). Correlation between process parameters, microstructure and properties of 316L stainless steel processed by selective laser melting. Materials Science and Engineering: A, 718, 64-73.
2. Wang, Z., Guo, Y., Zhou, L., & Zhang, M. (2021). Microstructure control via directional recrystallization in additively manufactured metals: Principles and methods. Additive Manufacturing, 46, 102171.
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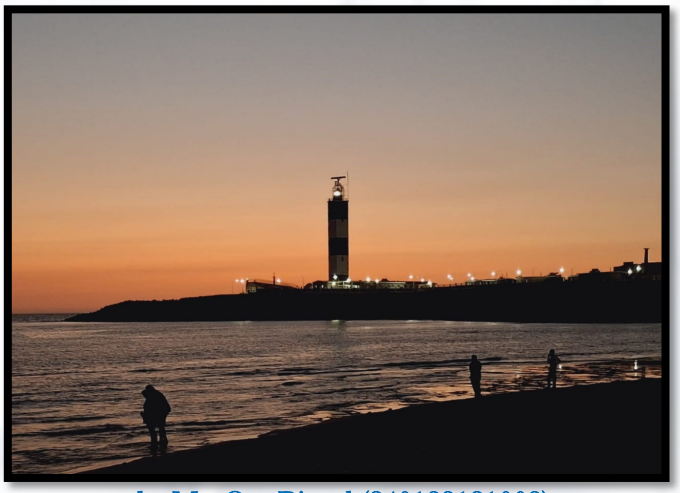
ART GALLARY

PHOTOGRAPHY



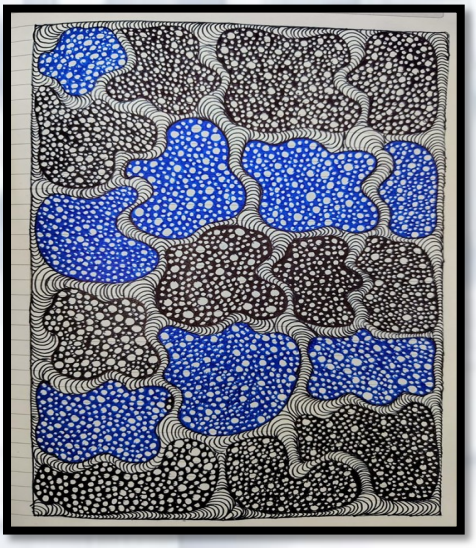
- by Mr. Om Biswal (240133121003)

- by Mr. Sunny Kabse (240133121016)

- by Mr. Shubham Sinha (240133121003)

- by Mr. Anish Bhujbal (240133121002)

SKETCHES



- By Ms. Jahnavi ponnaganti(240133121004)

પ્રો.ભાવેશ રોહિતકુમાર રાણા
(મેટલર્જી વિભાગ,સ.ઇ.કો,ગાંધીનગર)
સ્વ.તા.૩૦/૦૬/૨૦૨૫,અષાઢ સુદ -૫

We are deeply saddened to hear about the passing of Late. Prof. Bhavesh. R. Rana, a revered figure in the field of Metallurgy and an inspiring educator. His invaluable contributions to metallurgy & materials science and his dedication to nurturing generations of engineers will always be remembered with gratitude and respect.

May his soul attain sadgati and find peace in the divine abode. Our thoughts and prayers are with his family, students, and colleagues during this difficult time.

"Om Shanti"

ART GALLERY

मन का युद्ध

मन के भीतर चलता रण,
निरंतर उठता एक विकलण।
शांति का प्याला हाथ में हो,
भीतर हो जैसे धधकता तन।

इच्छाएँ बाँधें पाँव मेरे,
कर्तव्य खींचे अपनी ओर।
एक तरफ़ सपनों की धरती,
दूजी ओर धर्म का घोर।

अहम् कहे – "तू श्रेष्ठ बने,"
विवेक कहे – "तू सत्य चुने।"
भावनाओं का सागर गहरा,
सोचों की नौका डगमग डगमगाए।

कभी लगे – अब टूट ही जाऊँ,
कभी भीतर से हूक उठे – "ना रुक!"
क्षण-क्षण चलता मुझसे मुझमें,
जीत में भी हो कोई झुक।

मन का संग्राम है बड़ा विचित्र,
न तलवार, न ढाल, न मित्र।
पर जो जीते खुद की कथा,
वही रचे जीवन की व्यथा

- Written by Ms. Shibbu Singh (210130121010)

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॥ कर्ममयं ज्ञानं एवं ज्ञानमयं कर्म ॥