Annual Report: 2024-25 Department of Mechanical Engineering



Precision in Motion



Bharatiya Vidya Bhavan's Sardar Patel College of Engineering, Mumbai



Founder Kulapati Dr. K.M. Munshi

Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

Munshi Nagar, Andheri -West



Institute Vision

"Sardar Patel College of Engineering aspires to be an institution of national repute that will create professionals with competence and motivate research for the progress of the nation."





Institute Mission

- To impart quality education through the time-relevant curriculum in academic programs,
- To enhance career opportunities for students through industry institute interaction and value-added courses,
- To promote excellence by encouraging innovative ideas and lateral thinking,
- To inculcate a sense of discipline and responsibility toward society.



Table of **Contents**

•	A Note from Head of the Department	4
•	Departmental Vision and Mission	5
•	Department at a Glance	6
•	Program Educational Objectives (PEOs)	8
•	Program Outcomes (POs)	9
•	Journal Research Publications	10
•	Conference Research Publications	14
•	Patents, Consultancies, and Research Funding	15
•	Knowledge Sharing: Expert Lectures Delivered / Industry Experts	16
	Invited	
•	Skill Development: Training Programs / Workshops Conducted or	17
	Attendece	
•	Industry Engagement: Industrial Visits Organised / Participated	18
•	Other Achievements: Notable Contributions	19
•	Student Enrollment and Academic Performance	20
•	Student Achievements and Activities	21
•	Skill Development Course: Laser Engraving and 3D Printing	22
•	Final Year Best Project Awards 2024–25	23
•	GATE 2025 Achievements	24
•	Industrial Internships	25
•	Campus placement and Higher Studies	27
•	Doctoral Research Highlights	29
•	Inspiring Journeys: Our Students, Our Pride	30
	Annual Report 2024-25	

A Note from the Head of the Department

It is with great pride that I present the Annual Report for the academic year 2024–25 of the Mechanical Engineering Department at Sardar Patel College of Engineering, Mumbai. This year has been a milestone in our journey-marked by curriculum innovation, cutting-edge course inclusion, and outstanding student accomplishments.

We successfully implemented the R23 curriculum for both first and second-year B.Tech students, ushering in a dynamic and application-oriented learning framework. To meet the demands of an evolving job market, we introduced a Minor program in Industry 4.0 Technologies, focusing on automation, data-driven systems, and smart manufacturing.

In our push for experiential learning, we rolled out a hands-on skill development course on Laser Engraving and 3D Printing. Every participating student not only gained fabrication proficiency but also designed and 3D-printed intricate, complex, and extraordinary objects - prototypes that were once difficult to imagine, let alone manufacture. This initiative has significantly boosted students' creative confidence and real-world design capabilities.

Our faculty and students have maintained an excellent record in research, producing highimpact publications, securing prestigious grants, and leading collaborative projects across domains. We also celebrate the phenomenal success of our student teams. SPCE WAVE earned All India Rank 1 at the SAEINDIA Drone Development Challenge 2024, while SPCE Racing secured 5th rank overall at Formula Bharat 2025, excelling in design, business, and manufacturing modules.

With renewed national focus on core manufacturing sectors, the role of Mechanical Engineers has never been more crucial. At SPCE, we are committed to nurturing engineers who are not only technically sound but also industry-ready, innovative, and future-focused.

I extend my sincere gratitude to our dedicated faculty, aspiring students, and supportive alumni whose contributions have been instrumental in our continued success.

Dr. Ramsubhash Maurya

Head of Department, Mechanical Engineering Sardar Patel College of Engineering, Mumbai



DEPARTMENT OF MECHANICAL ENGINEERING, SPCE Mumbai

Departmental Vision and Mission

Vision

"To be a nationally recognized mechanical engineering department producing a blend of responsible and competent engineering graduates with research motivation and inculcation of human values."

Mission Statements

- To impart need-based technical education by designing a curriculum in collaboration with stakeholders
- To develop linkages with renowned industries and research organizations in India and abroad for excellence in teaching and research
- To provide state of art laboratories and facilities to encourage innovative ideas and lateral thinking and to impart field knowledge to mechanical engineering students
- To encourage the students to participate in extracurricular activities for overall personality development and be responsible person of the society.



Department at a Glance

The Department of Mechanical Engineering at Sardar Patel College of Engineering (SPCE), established in 1962, continues to stand as a pillar of excellence, blending tradition with innovation in technical education. With a legacy spanning over six decades, the department offers:

- B.Tech. in Mechanical Engineering (Intake: 60 + Lateral Entry)
- B.Tech. in Mechanical Engineering for Working Professionals (Intake:30)
- M.Tech. in Machine Design (Intake: 18)
- Ph.D. in Mechanical Engineering (Total Permissible Seats: 60)

Both B.Tech. and M.Tech. programs are NBA-accredited, reflecting the department's enduring commitment to academic rigor and quality assurance.

Our strength lies in our highly qualified, experienced, and dedicated faculty, who combine conventional wisdom with modern pedagogies to deliver both foundational and frontier knowledge. This academic strength was further enriched with the induction of Prof. Deepak Singh and Prof. Don Augusty Plackal, and was marked by a significant milestone when Prof. Parag K. Muley successfully defended his Ph.D. in Cryogenic Engineering in May 2025 at IIT Mumbai.

Keeping pace with the evolving education landscape and aligned with the National Education Policy (NEP) 2020, the department implemented the new R-23 regulation for first- and second-year B.Tech. students. The academic year 2024–25 witnessed the seamless coexistence of R-18, R-22, and R-23 curricula, showcasing our agility in managing academic transitions. A minor in Industry 4.0 technologies was also introduced to align our students' learning with the dynamic demands of the global job market. The department's curriculum emphasizes experiential and application-based learning. A notable addition this year was a skill development module on laser engraving and 3D printing. As part of this course, every student successfully designed and fabricated extraordinary, intricate, and technically complex 3D-printed models- an experience that stimulated creativity, innovation, and hands-on mastery.

Furthering our commitment to excellence, the Blue Star Centre of Excellence was inaugurated in February 2025 to provide cutting-edge training in HVAC and refrigeration. In a parallel stride toward sustainability, a 30 kWp rooftop solar power plant was installed and made operational under the leadership of a mechanical faculty member - demonstrating our alignment with national green energy initiatives



DEPARTMENT OF MECHANICAL ENGINEERING, SPCE Mumbai

Industrial immersion remains a cornerstone of our pedagogy. Students engage in industrial visits, expert talks, industry-sponsored projects, and internships that bridge theoretical concepts with real-world applications. These are complemented by co-curricular involvement in active student bodies such as MESA, TESA, IIIE, ASHRAE, ISHRAE, SAEINDIA, and specialized clubs like SPCE Racing, SPCE WAVE, and SPCE Robocon - nurturing leadership, collaboration, and technical excellence.

The department functions in harmony with the vision and mission of SPCE and Bharatiya Vidya Bhavan, aspiring to shape engineers who are not only technically sound but also socially conscious and ethically grounded.

Nestled in a serene, eco-conscious green campus, the department offers a holistic educational environment. Well-furnished hostels, a modern library, innovation labs, wellness zones, and sports facilities converge to ensure the all-round development of our students.

The department takes immense pride in the stellar achievements of its students, who consistently perform at the national stage - be it GATE, UPSC, or international admissions, or prestigious awards in design, research, and innovation.

With a perfect blend of strong academics, cutting-edge infrastructure, active industry collaboration, and a thriving student culture, the Department of Mechanical Engineering at SPCE continues to evolve as a hub of future-ready engineers, echoing excellence in every stride.



DEPARTMENT OF MECHANICAL ENGINEERING, SPCE Mumbai

Program Educational Objectives (PEOs)

BTech in Mechanical Engineering

PEO1: Graduates will apply knowledge gained in engineering to improve lives and subsistence through a successful career in mechanical engineering and other interdisciplinary fields.

PEO2: Graduates will become entrepreneurs, innovators and researchers to address social, technical and business challenges.

PEO3: Graduate will engage in lifelong learning such as higher studies, research and other continuous professional development activities.

MTech in Machine Design

PEO1: Graduates will apply knowledge gained in engineering to improve lives and subsistence through a successful career in Design Engineering and associated fields.

PEO2: Graduates will become academicians, researchers, and consultants to address social, technical, and business challenges.

PEO3: Graduate will engage in lifelong learning such as higher studies, research, and other continuous professional development activities.



Program Outcomes(POs)

Engineering Graduates will be able to:

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Page 9



Journal Research Publications

The Department has continued its strong emphasis on research and development. Faculty members and research scholars have published and presented extensively in peer-reviewed journals and reputed conferences. The following is a summary of key research contributions made during the academic year 2024–2025.

A. Journal Publications

1. Thigale, S. P., Jadhav, H. M., Mulani, A. O., Birajadar, G. B., Nagrale, M., & Sardey, M. P. (2024). Internet of things and robotics in transforming healthcare services. Afr J Biol Sci (S Afr), 6(6), 1567-1575.

2. Nagrale, M., Pol, R. S., Birajadar, G. B., Mulani, A. O., Kutubuddin, K., & Liyakat, S. (2024). Internet of robotic things in cardiac surgery: an innovative approach. African Journal of Biological Sciences, 6(6), 709-725.

3. Mulani, A. O., Liyakat, K. K. S., Warade, N. S., Patil, A., Kolte, M. T., Kinage, K., ... & Nagrale, M. (2024). IoT Sensors in a Wireless Environment for Healthcare Monitoring: A Framework for Fault Detection. Journal of Pharmacology and Pharmacotherapeutics, 0976500X251324735.

4. Khan, Y., Singh, D., Kumar, S., Mishra, S., Anjum, A., & Asdaque, P. M. G. (2024). Performance evaluation of the combined helium Brayton cycle and organic Rankine cycles for solar power tower application—A comparative study. Journal of Renewable and Sustainable Energy, 16(6).

5. Patil, A., & Ingle, Singh, D (2024). Modeling & optimization of Ti6Al4V turning for sustainable shearing considering rake angle. Research on Intelligent Manufacturing and Assembly, 3(1), 118-128.

6. Industrial Automation and Data Processing Techniques in IoT-Based Digital Twin Design for Thermal Equipment: A case study, SS Chaudhari, KS Bhole, SB Rane, Journal of The Institution of Engineers (India): Series C, 1-17, 2025

7. Influence of micro-textures on wettability and antibacterial behavior of Titanium surfaces against S. aureus and E. coli: in vitro studies, M Nikam, S Mane, S Jadhav, S Jadhav, S Mastud, K Bhole, T Roy, International Journal on Interactive Design and Manufacturing (IJIDeM) 19, 2025

8. A practical approach towards utilisation of the net-shaped micro-structures developed in the lifting plate Hele–Shaw cell for micro-mixing, BS Kale, KS Bhole, D Bhole, S Kolhe, International Journal on Interactive Design and Manufacturing (IJIDeM) 19, 2025

9. Controlling Viscous Pattern Formation in a Lifting Plate Hele-Shaw Cell Through Surface Roughness Modulation, S Swami, S Phulmali, M Narayanan, BS Kale, KS Bhole, Journal of The Institution of Engineers (India): Series C, 1-13, 2025

10. Synthesis of Sodium Chloro Fluoride system for generating micro fractal type structures for microfluidic applications, S Valvi, KS Bhole, BS Kale, J Gholave, J Jagtap, International Journal on Interactive Design and Manufacturing (IJIDeM) 18, 2024

Page 10



Journal Research Publications

11. Machine learning approach to predict viscous fingering in Hele-Shaw cells, AA Lendhe, N Raykar, BS Kale, KS Bhole, International Journal on Interactive Design and Manufacturing (IJIDeM) 18, 2024

12. Computer aided approach for case specific design of fixture for slot milling process, U Pawar, SG Chavan, KS Bhole, M Rathod, D Bhole, International Journal on Interactive Design and Manufacturing (IJIDeM), 2024

13. Geometrical operating parameter's analysis used in flexural cartridges, SM Shinde, K Bhole, M Diwan, International Journal on Interactive Design and Manufacturing (IJIDeM), 2024

14. Reliability improvement of molded case circuit breaker using Design for Six Sigma, SB Rane, SG Bidikar, PR Potdar, International Journal of Quality & Reliability Management 2025

15. Integrated IoT-Blockchain architecture for sustainable green supply chains in agriculture equipment manufacturing industries: a TOPSIS approach, RS Chaudhari, SB Rane, SK Mahajan, RK Phanden, YK Mogal, International Journal of Computer Integrated Manufacturing, 1-32 2025

16. Barriers to adoption of reusable packaging from supply chain perspective: multi criteria decision making analysis and industry 4.0 strategies SB Rane, GJ Abhyankar, MS Kirkire, OPSEARCH, 1-52, 2025

17. Reliability-centered maintenance (RCM) for multistate systems, PR Potdar, SB Rane, System Reliability Analysis, 269-290, 2024

18. An application of IIoT framework in system design, performance monitoring and control for industrial process heater, SS Chaudhari, KS Bhole, S Rane, International Journal on Interactive Design and Manufacturing (IJIDeM), 2024

18. Comparison on conventional and digital technology assisted design methodologies of process heater radiant section, S Chaudhari, KS Bhole, S Rane, International Journal on Interactive Design and Manufacturing (IJIDeM), 2024

19. IoT-enabled crop waste mulching machine for sustainable farming: perspective of circular economy, RS Chaudhari, SB Rane, SK Mahajan, YK Mogal, Engineering Research Express 6 (4), 045550, 2024

20. Investigation of wear characteristics of granite dust & coconut shell ash reinforced aluminum metal matrix composite using design of experiment, YK Mogal, SB Rane, SK Mahajan, RS Chaudhari, Engineering Research Express 6 (3), 035560, 2024

21. Technological integration of lean manufacturing with industry 4.0 toward lean automation: insights from the systematic review and further research directions, P Saraswat, R Agrawal, SB Rane, Benchmarking: An International Journal, 2024

Constant A VIOLA BAR ANA DA CONSTANTA DA CONSTANTA DA CONSTANTA DA CONSTANTA DA CONSTA

DEPARTMENT OF MECHANICAL ENGINEERING, SPCE Mumbai

Journal Research Publications

22. Implementation of blockchain–IoT-based integrated architecture in green supply chain, SV Thakker, SB Rane, VS Narwane, Modern Supply Chain Research and Applications 6 (2), 122-145, 2024

23. Investigation on mechanical behavior of Al6061-coconut shell ash-granite dust reinforced hybrid metal matrix composites manufactured using stir casting technique, YK Mogal, SB Rane, SK Mahajan, RS Chaudhari, Engineering Research Express 6 (2), 025515, 2024

24. Correction to: Optimization of a shift in the natural frequency of a nitinol-reinforced composite beam, RA Patil, SB Rane, SB Kumbhar, International Journal on Interactive Design and Manufacturing (IJIDeM) 18, 2024

25. Optimization of a in the natural frequency of a nitinol-reinforced composite beam, RA Patil, SB Rane, SB Kumbhar, International Journal on Interactive Design and Manufacturing (IJIDeM) 18, 2024

26. Strategies for Green Supply Chain for Agriculture Equipment Manufacturing Industries: Perspective of Blockchain-IoT Integrated Architecture, RS Chaudhari, SB Rane, SK Mahajan, R Agrawal, International Journal of Mathematical, Engineering and Management Sciences 9, 2024

27. Reliability improvement of molded case circuit breaker using Design for Six Sigma, SB Rane, SG Bidikar, PR Potdar, International Journal of Quality & Reliability Management 2025

28. Integrated IoT-Blockchain architecture for sustainable green supply chains in agriculture equipment manufacturing industries: a TOPSIS approach, RS Chaudhari, SB Rane, SK Mahajan, RK Phanden, YK Mogal, International Journal of Computer Integrated Manufacturing, 1-32 2025

29. Industrial Automation and Data Processing Techniques in IoT-Based Digital Twin Design for Thermal Equipment: A case study, SS Chaudhari, KS Bhole, SB Rane, Journal of The Institution of Engineers (India): Series C, 1-17,2025

30. Barriers to adoption of reusable packaging from supply chain perspective: multi criteria decision making analysis and industry 4.0 strategies SB Rane, GJ Abhyankar, MS Kirkire, OPSEARCH, 1-52, 2025

31. Reliability-centered maintenance (RCM) for multistate systems, PR Potdar, SB Rane, System Reliability Analysis, 269-290, 2024

32. An application of IIoT framework in system design, performance monitoring and control for industrial process heater, SS Chaudhari, KS Bhole, S Rane, International Journal on Interactive Design and Manufacturing (IJIDeM), 2024

33. Comparison on conventional and digital technology assisted design methodologies of process heater radiant section, S Chaudhari, KS Bhole, S Rane, International Journal on Interactive Design and Manufacturing (IJIDeM), 2024

34. IoT-enabled crop waste mulching machine for sustainable farming: perspective of circular economy, RS Chaudhari, SB Rane, SK Mahajan, YK Mogal, Engineering Research Express 6 (4), 045550, 2024

Page 12



Annual Report 2024-25

Journal Research Publications

35. Investigation of wear characteristics of granite dust & coconut shell ash reinforced aluminum metal matrix composite using design of experiment, YK Mogal, SB Rane, SK Mahajan, RS Chaudhari, Engineering Research Express 6 (3), 035560, 2024

36. Technological integration of lean manufacturing with industry 4.0 toward lean automation: insights from the systematic review and further research directions, P Saraswat, R Agrawal, SB Rane, Benchmarking: An International Journal, 2024

37. Implementation of blockchain–IoT-based integrated architecture in green supply chain, SV Thakker, SB Rane, VS Narwane, Modern Supply Chain Research and Applications 6 (2), 122-145, 2024

38. Investigation on mechanical behavior of Al6061-coconut shell ash-granite dust reinforced hybrid metal matrix composites manufactured using stir casting technique, YK Mogal, SB Rane, SK Mahajan, RS Chaudhari, Engineering Research Express 6 (2), 025515, 2024

39 Correction to: Optimization of a shift in the natural frequency of a nitinol-reinforced composite beam, RA Patil, SB Rane, SB Kumbhar, International Journal on Interactive Design and Manufacturing (IJIDeM) 18, 2024

40 Optimization of a shift in the natural frequency of a nitinol-reinforced composite beam, RA Patil, SB Rane, SB Kumbhar, International Journal on Interactive Design and Manufacturing (IJIDeM) 18, 2024

41 Strategies for Green Supply Chain for Agriculture Equipment Manufacturing Industries: Perspective of Blockchain-IoT Integrated Architecture, RS Chaudhari, SB Rane, SK Mahajan, R Agrawal, International Journal of Mathematical, Engineering and Management Sciences 9, 2024

42. S. Valvi, K. S. Bhole, B. S. Kale, J. Gholave, and J. Jagtap, "Synthesis of Sodium Chloro Fluoride system for generating micro fractal type structures for microfluidic applications," International Journal on Interactive Design and Manufacturing (IJIDeM), vol. 18, no. 10, pp.7241–7249, doi: 10.1007/s12008-023-01603-2.

43. R. B. Buktar, Y. Y. More, "Implementation of Industry 4.0 and Digital Manufacturing Practices in Indian Manufacturing Industries Using Discrete Event Simulation (DES)", Pan-American Mathematical Journal ISSN: 1064-9735 Vol. 33 No. 3 (2023)

44. Published research paper on "Leveraging IoT in Auto Component Manufacturing to Monitor Surface Roughness and Tool Temperature", Rajesh Buktar, Tushar Bhoite, Georgena Kannukkadan, Dhanashree Bhoite, Journal of Electrical Systems, 20-2s(2024):1227-1239,.

45 Published research paper on "Investigating smart manufacturing process implementation in the Indian manufacturing industries using tecnomatix and response surface methodology", Dr. R. B. Buktar, Y. Y. More, International Journal on Interactive Design and Manufacturing (IJIDeM), 15th June 2024.

Page 13



Conference Research Publications

• Dr. Megha Nagrale

Title: Experimental Investigation of Torsional Fatigue Behaviour in Pure Epoxy Resin Event: 2nd International Conference on Advances in Thermal Systems, Materials, and Design Engineering (ATSMDE 2024), VJTI Mumbai, 27–28 Dec 2024.

• Dr. Sachin Vankar

Title: Experimental Investigation of Torsional Fatigue Behaviour in Pure Epoxy Resin Event: ATSMDE 2024, VJTI Mumbai.

• Prof. Haseen Shaikh

Title: Evaluating Tilt Angles and Reflector Types for Enhanced Irradiance in Vertical Bifacial PV Systems

Event: ATSMDE 2025, VJTI Mumbai.

• Mr. Vinay D. Patel, R. S. Maurya

Title: Advanced Thermal Characterization of Rubitherm RT35 in Energy Storage Systems Event: International Conference on ASSET 2025, IIT Guwahati.

- Dr. Parag K Muley
- 1. Title: Design, Manufacturing and Testing of a Portable Cooling Jacket, 2024, 8th National and 2nd International Conference on Refrigeration and Air-conditioning (NCRAC-2024), IIT Madras; 13-15 March 2024.
- 2. Title: Design, Analysis and Development of an Efficient Thermal Management System for Electric Vehicles, 2024, The UNIfied International Conference on Emerging Technologies in Cyber-Physical Systems and Industrial AI (UNIfied-2024), MNIT Jaipur, 26-28 November 2024
- 3. Title: Condition Monitoring- An Emerging Predictive Maintenance Technique in Continuous Process Plants, 2024, The UNIfied International Conference on Emerging Technologies in Cyber-Physical Systems and Industrial AI (UNIfied-2024), MNIT Jaipur, 26-28 November 2024.
- 4. Title: Design Analysis of Helium compressor for G-M Cryocooler, 2024, 2nd International Conference on Advances in Thermal Systems, Materials and Design Engineering (ATSMDE-2024), VJTI Mumbai, 27-28 December 2024

Page 14



Patents, Consultancies, and Research Funding

A. Patents

Dr. Megha Janbandhu

Patent Title: IoT-Based Agricultural Robot for Pesticide Spraying Patent Number: 418216-001, Date of Award: 28th May 2024

B. Consultancies

• Dr. Megha Janbandhu

Project: Design Vetting of 20T Capacity EOT Crane, Client: NSY Karwar, Karnataka Scope: Electrical Drawings, Main Girder and Mechanism Calculations, and Detailed Drawings Amount: ₹1,20,000, Date: May 2024

• Dr. Kiran Bhole and Dr. B. N. Bhasme

Project: Performance Testing of Jet Pump, Client: Aryan Pumps and Enviro Systems Pvt. Ltd. Amount: ₹41,300, Date: August 2024

C. Research Grants

• Dr. B. N. Bhasme

Title: Laboratory Refrigeration Unit with Transparent Evaporator, Real-Time Data Monitoring and IoT Integration

Funding Agency: ASHRAE – International Program Equipment Grant, Amount: USD 2,980 Year: 2024–25

• Dr. Kiran S. Bhole

Title: Modular and Reconfigurable Digital Twin-Based Temperature and Flow Monitoring Setup for Thermal Systems

Funding Agency: ASHRAE – Undergraduate Program Equipment Grant, Amount: USD 4,092 Date: April 2025

• Dr. Kiran S. Bhole (Co-Investigator – SPCE)

Project Title: Sustainable Milling Strategies for Machinability Improvement of Ti6Al4V Funding Agency: Aeronautical Research and Development Board (DRDO)

Collaborating Institutions: VJTI, SPCE, HAL, and Bhujbal Knowledge City Institute of Engineers, Nashik, Amount: ₹1.48 Crore

Date of Sanction: 11th May 2025

• Dr. Kiran S. Bhole (Principal Investigator – SPCE)

Project Title: Technology Development for Controlled Fabrication of 2D and 3D Net-Shaped Microstructure Using Lifting Plate Hele-Shaw Cell

Funding Agency: Department of Science and Technology (DST)

Collaborating Institute: Fr. Conceicao Rodrigues Institute of Technology, Vashi,

Amount: ₹43.117 Lakh, Date of Sanction: 9th May 2025



DEPARTMENT OF MECHANICAL ENGINEERING, SPCE Mumbai

Knowledge Sharing: Expert Lectures Delivered / Industry Experts Invited

- Dr. Santosh B. Rane delivered a talk on "Research Ecosystem under NEP 2020" at APSIT Thane on 18th January 2025. The event was organized by University of Mumbai and A. P. Shah Institute of Technology, Thane.
- 2. Dr. Santosh B. Rane delivered a lecture on "Cyber-Physical Systems (CPS) and Digital Twins in Manufacturing" during the ISTE-approved STTP on "Advances in Manufacturing" at St. John College of Engineering and Management (SJCEM), Palghar on 7th February 2025.
- 3. Prof. Kunal Bhavsar organized a webinar by Mr. Robert Bean (USA) on "Fundamentals of ASHRAE STANDARD 55" on 21st February 2025, supported by ASHRAE Mumbai Chapter.
- 4. An expert lecture on "Digital Twin" by Mr. Rupesh Umtol, Past President, ASHRAE Mumbai Chapter, was organized by Prof. Kunal Bhavsar at SPCE on 20th March 2025, with participation from over 30 students.
- 5. Dr. Rajesh Buktar delivered an expert lecture on "Digital Twin A Digital Technology for Business Transformation" for GMP Batch 18-2023 at SPJIMR on 12th September 2023.
- 6. Dr. Rajesh Buktar delivered an expert lecture on "Industry 4.0 and Digital Twin" in the ATAL FDP titled "Digital Twin-Based Predictive Maintenance Approach for Industry 4.0 Using Machine Learning Techniques," conducted at VJTI, Mumbai from 4th to 9th December 2023.
- 7. Dr. Rajesh Buktar delivered an expert lecture on "Role of IoT, AR & VR in Digital Marketing" for GMP Batch 18-2023 at SPJIMR on 12th September 2023.
- 8. Dr. Rajesh Buktar delivered a talk on "Driving Digital Transformations with Augmented Reality" for GMP Batch 18-2023 at SPJIMR on 12th September 2023.
- 9. Under SPCE ASHRAE activities, Prof. Kunal Bhavsar organized a full-day workshop on "HVAC Fundamentals by ASHRAE", with an expert lecture by Mr. Vikram Murthy on 26th October 2024. The event saw participation from 35+ students and 10 industry professionals
- 10. Dr. Parag K Muley conducted sessions at MED, SPCE, which includes classroom lecture and laboratory practical on 'Internal Combustion Engines' for S.Y. B.Sc. Physics students of Bhavans College, Andheri (W), Mumbai under NEP-2020, 10 October 2024.

A CALLEGE DI COLLEGE D

DEPARTMENT OF MECHANICAL ENGINEERING, SPCE Mumbai

Skill Development: Training Programs / Workshops Conducted or Attended

- 1. Dr. Megha Janbandhu attended a one-day workshop on "Ultrafast Laser Micro-Fabrication" held at IIT Bombay on 22nd November 2024.
- 2. Dr. Megha Janbandhu attended a one-day awareness program on "ORCID and INFLIBNET Services" at VNIT, Nagpur on 25th October 2024.
- 3. Dr. Megha Janbandhu participated in a one-week online FDP on "EV Technology and Public Charging Station" at the National Institute of Electronics and Information Technology, Calicut, from 1st to 5th April 2024.
- 4. Dr. Sachin Vankar attended the ATAL FDP titled "From Data to Impact: AI in Healthcare and Agriculture" from 9th to 14th December 2024.
- 5. Dr. Sachin Vankar attended the ATAL FDP on "Quality Computing: India's Journey Towards Quantum Excellence" from 13th to 18th January 2025.
- 6. Dr. Sachin Vankar attended the ATAL FDP on "Ethical Hacking and VAPT Mastery: Keystones of Cyber Security for Unnat Bharat" from 6th to 11th January 2025.
- 7. Dr. Kiran Bhole attended a one-week ISTE-approved STTP on "Application of AI-ML-DL in Product Life Cycle Design and Management" on 22nd July 2024.
- 8. Prof. D. N. Jadhav attended a one-day online training program on the "POSH Act 2013 (Prevention of Sexual Harassment at Workplace)" on 21st March 2025.
- 9. Dr. Rajesh Buktar attended an ISTE-approved six-day STTP on "Exploring Generative AI and Explainable AI: Concepts to Applications", organised by Thakur College of Engineering & Technology from 24th to 29th June 2024.
- 10. Dr. Rajesh Buktar participated in a one-day Faculty Knowledge Sharing Program on the theme "Information Technology in Education" at ICFAI Business School, Hiranandani Gardens, Mumbai on 1st August 2024.
- 11. Dr. Parag K Muley attended a one day seminar 'Liquid Hydrogen: Current Uses and Future Prospects' organized by IIT Bombay and ICC, West Zone, 15 June 2024.
- 12. Dr. Parag K Muley attended a one Week ISTE approved STTP on Internet of Things 'Empowering Innovation with IoT: Concepts to Applications' organized by Vidyalankar Polytechnic, Mumbai, 30 June-04 July 2025.



Industry Engagement: Industrial Visits Organised / Participated

- 1. Prof. Kunal Bhavsar and Dr. B. N. Bhasme organised an industrial visit to Blue Star Wada Plant under the ASHRAE SPCE Student Chapter on 16th May 2024, accompanied by approximately 25 students.
- 2. An industrial visit to Sigma Packaging Solutions, Vasai, was conducted on 27th and 28th September 2024 under MESA, accompanied by Dr. Megha Janbandhu and Dr. Sachin Vankar.
- 3. A visit to the Dhruva Reactor, BARC, Anushaktinagar, Mumbai, was organised on 2nd March 2025 under MESA, with Dr. Megha Janbandhu accompanying the students.
- 4. An industrial visit to Ambetronics Pvt. Ltd., Andheri East, was conducted on 8th March 2025 for ASHRAE SPCE Student Members. The visit was attended by 25 students along with Prof. Kunal Bhavsar.
- 5. Dr. Santosh B. Rane and Prof. D. N. Jadhav organised an industrial visit to Reliance Metro One, Andheri West, under the IIIE Student Chapter on 18th March 2025.
- 6. A two-day industrial visit to Kalyan Diesel Shed was conducted under MESA on 7th and 8th April 2025. A total of 68 SY BTech (Mechanical) students participated in the visit.





Other Achievements: Notable Contributions

- 1. Dr. Rajesh Buktar served as a reviewer for two research papers submitted to Journal of Industrial Information Integration, an Elsevier Q1-ranked journal.
- 2. Prof. B. N. Bhasme contributed to the establishment of a 33 kWp Rooftop Solar Power Plant and executed the project in the capacity of Chairman.
- 3. Prof. B. N. Bhasme also contributed to the establishment of the Green Lab, envisioned as a seed laboratory for renewable energy research at the institute level.
- 4. Prof. Sharad Valvi worked as a translator for the NPTEL course "Energy Conservation and Waste Heat Recovery" (Course Code: 112105221) offered by IIT Kharagpur, aiming to enhance content accessibility for a broader audience.
- 5. Dr. Santosh B. Rane played a key role in the establishment of the Blue Star Centre of Excellence Laboratory in February 2025, aligned with the Government of India's skill development and industry-academia collaboration initiatives.
- 6. Dr. Megha Janbandhu served as Reviewer for the 2nd International Conference on Advances in Thermal Systems, Materials and Design Engineering (ATSMDE-2024) held on 27th & 28th December 2024 by the Department of Mechanical Engineering, VJTI Mumbai.
- 7. Under the mentorship of Dr. Megha Janbandhu, MESA organised a Blood Donation Drive on 28th September 2024, where 77 students participated as donors.
- 8. Dr. Kiran S. Bhole worked as Session Chair during the International Conference on Technologies for Energy, Agriculture and Healthcare (ICTEAH 2024) held on 15th & 16th April 2024.
- 9. Prof. Parag K Muley successfully defended his Ph.D. Thesis and awarded Ph.D. degree by IIT Bombay in June 2025 (Sponsored by SPCE, Mumbai under QIP).





• •

Student Enrollment and Academic Performance

Semester-wise Student Enrollment

1	First year of Mechanical Engineering	67
2	Second Year of Mechanical Engineering	73
3	Third Year of Mechanical Engineeering	64
4	Final Year of Mechanical Engineering	74

Term-1 Academic Performance of Students

Sr. No.	Examination	No. of student appeared	% Passing
1.	Semester -III	77	71.43
2.	Semester -V	71	94.37
3.	Semester -VII	62	95.16

Term-2 Academic Performance of Students

Sr. No.	Examination	No. of student appeared	% Passing
4.	Semester -IV	76	84.21
5.	Semester -VI	71	95.77
· · · 6. ·	Semester -VIII	62	98.38

Page 20



DEPARTMENT OF MECHANICAL ENGINEERING, SPCE Mumbai

Student Achievements and Activities

- 1. Team Shourya SPCE WAVE secured Overall Rank-1 in the Regular Category and AIR-1 for Best Technical Report in the Drone Development Challenge 2024 organized by SAEINDIA Southern Section from 29th to 31st August 2024.
- 2. The SPCE Racing Electric team, consisting of 58 students, participated in Formula Bharat 2025 held at Kari Motor Speedway, Coimbatore from 22nd to 27th January 2025. The team secured **Overall 5th Rank**, with:
 - 4th place in the Business Plan event,
 - 6th place in Cost & Manufacturing, and
 - 7th place in Engineering Design.
- 3. Mr. Bhiva Mohan Jethe won the **Best Paper Presentation Award** at the 11th International and 51st National Conference on Fluid Mechanics and Fluid Power (FMFP-2024), held at AMU during 21st–23rd December 2024, for his research titled "Effect of Surface Roughness and Viscosity on Formation of Fractals."
- 4. MESA organized a Blood Donation Camp on 30th October 2024, with enthusiastic participation from over 70 students and faculty members.
- 5. A Five-Day Online Faculty Development Program on "Shape Memory Alloy and Composite Materials" was organized by the Mechanical Engineering Department in collaboration with SEAINDIA Collegiate Club and SEAINDIA Western Section from 4th to 8th February 2025.
- 6. Mr. Shreyas Waideshkar received the Prestigious **SAEINDIA Foundation Award** along with a Scholarship of ₹4000 from the SAEINDIA Western Section in January 2025.
- 7. Mr. Pratik Burkul received the **Ramesh Suri Award for Best Innovation in Technology** in November 2024, under the SEAINDIA Foundation Award 2023–24 (Western Section).
- 8. Mr. Pratik Burkul was also awarded the **Mobility Startup of the Year Award** for Best Innovation in Technology in November 2024 under SEAINDIA Foundation's Western Section.
- 9. Ms. Shreya Bhatt, Final Year Mechanical Engineering student, was nominated for the Bank of Baroda Award-2025.
- 10. The Mechanical Engineering Student's Association (MESA) conducted 'Shastra', an intradepartmental sports competition from 3rd to 5th April 2025.
- 11. Mr. Akhil Pillai of SYBTech (Mechanical) received the ASHRAE Undergraduate Legacy Scholarship of \$5000 for the academic year 2025–26.
- 12. Mr. Shivang Anil Tiwari (Batch 2017–2021) secured AIR 752 in UPSC CSE 2024 and AIR 92 in UPSC IFS 2024, bringing great pride to the department.



DEPARTMENT OF MECHANICAL ENGINEERING, SPCE Mumbai

Skill Development Course: Laser Engraving and 3D Printing

A hands-on skill development course on Laser Engraving and 3D Printing was conducted to equip students with practical knowledge of modern prototyping technologies. The course covered machine setup, operation, material handling, and troubleshooting techniques.

Students worked on individual and group projects, creating personalized items like keychains, nameplates, functional prototypes, and artistic models using various materials. The capstone projects showcased their ability to integrate both technologies effectively.

Photographs of selected student works are included to highlight creativity, technical skill, and practical application. The course enhanced students' confidence in digital fabrication and design innovation.



Final Year Best Project Awards 2024–25

Mechanical Marvel Platinum Thesis Excellence

- Awardees:
 - Mr. Narayanan Madan Lekshmi
 - Mr. Shashank Phulmali
 - Mr. Swami Suraj Narendra
- Project Title: "Investigation on Effect of Surface Roughness of Substrate and Fluid Properties on Formation of Viscous Fingering."

Mechanical Marvel Gold Thesis Achievement

- Awardees:
 - Mr. Gunjal Harshal Bhaurao
 - Mr. Sarthak Sanjay Gutte
 - Mr. Todankar Harsh Sachin
- Project Title: "Cooling System for Electric Vehicles."
- Mechanical Marvel Silver Thesis Distinction
 - Awardees:
 - Mr. Ade Yash Sunil
 - Mr. Bhamare Siddhesh Sunil
 - Mr. More Anisha Sanjay
 - Project Title: "Design and Analysis of Passive Mechanical Anti-Roll Bar for FSAE Car and Modeling of Electro-Mechanical Anti-Roll Bar."



GATE 2025 Achievements

A total of 26 students from the Department of Mechanical Engineering appeared for the GATE 2025 examination. The department proudly acknowledges the commendable performance of the following students who qualified successfully:

Sr. No.	Name of the Student (Reg. No.)	GATE Paper	Score	Rank
1	Atharva Ghate (M2110019)	ME	75.00	587
2	Aditya Gautam (M2110018)	ME	49.63	4104
3	Saif Mozawala (M2110045)	ME	45.00	5262
4	Aditya Pandit (M2210048)	ME	40.00	6790
5	Atharva Ghate (M2110019)	XE	57.00	199
6	Saish Parab (2210049)	XE	41.33	1048
7	Kruti Jharbade (2210025)	XE	28.33	2906

Note: Mr. Atharva Ghate qualified in both ME and XE papers with excellent performance.



Industrial Internships

Internship:

A total of 46 students gone for industrial internship during AY 2024-25. A partial list is presented here.

Sr. No.	Students Name	Name of the Company	Duration
01	Rishit Jagannath Pawar	HPCL Mumbai Refinery	1 Month
02	Neelanjana Mandal	Carriage Repair Workshop, Lower Parel	17 Days
03	Aryan Sawant	Carriage Repair Workshop, Lower Parel	17 Days
04	Nevan Panchal	Carriage Repair Workshop, Lower Parel	17 Days
05	Parth Wadnerkar	Carriage Repair Workshop, Lower Parel	17 Days
06	Tejas Dipak Jadhav	Jabil Circuits Pvt. Ltd	29 Days
07	Rohan D. Sukhasare	KT Industrial Park 2, Aesseal Cold Pvt. Ltd	1 Month
08	Rishit Jagannath Pawar	Carriage Repair Workshop, WR	18 Days
09	Aditya Raju Shinde	Carriage Repair Workshop, WR	17 Days
10	Amey K. Gavakar	Castrol India Limited, Patalganga	1 Month
11	Neelanjana Mandal	Defense Institute of Adv Technology (DIAT)	52 Days
12	Amey K. Gavakar	Blue Star Ltd.	2 Months
13	Amruta Arjun Patil	Belimo Automation India Pvt. Ltd	1 Month
14	Vidhi Ahuja	Oil and Natural Gas Corporation (ONGC)	1 Month
15	Guru S. Patil	M&M Ltd, automotive Sector	2 Months
16	Pratik Arun Pardeshi	Afcons Infrastructure Ltd	2 Months
17	Akhil Pillai	Toyo Engineering India Pvt. Ltd	1 Month
18	Shubham G Revagade	Aditya Birla Ultratech Cement	1 Month
19	Shreya Sushil More	Eskayem Consultants Pvt. Ltd	1 Month

SARDARIA BURLINA BURLI

DEPARTMENT OF MECHANICAL ENGINEERING, SPCE Mumbai

Annual Report 2024-25

Sr. No.	Students Name	Name of the Company	Duration	
20	Dakshay Vijay Sarode	Air Force Station 11 BRD	1 Month	
21	Janhavi Sandesh Pande	BOSCH Ltd	1 Month	
22	Aditya Mahesh Kharat	Mahindra Salasar Autocraft Pvt	1 Month	
23	Kruti Gautam Jharbade	ISRO SAC Scietific Research and Training	2 Months	
24	Kruti Gautam Jharbade	ISRO Satish Dhawan Space Centre, Shar	2 Months	
25	Harshika G. Mhapsekar	Jacobs Soultion India Pvt. Ltd	2 Months	
26	Mihir Jagdish Parab	Indian Oil Corpration Ltd	47 Days	
27	Aditya Mj Duddalwar	J. K. Fenner (India) Limited	42 Days	
28	Atharva Joshi	Reliance Industries Limited	2 Months	
29	Malhar Takawale	Hindustan Aeronatics Linited (HAL)	41 Days	
30	Tanmay S. Varerkar	Belimo Automation India Pvt. Ltd	1 Month	
31	Biniwade P Sunil	Central Railway Loco Workshop	12 Days	
32	Dakshay Sarode	Central Railway Loco Workshop	12 Days	
33	Nishant Raj	Central Railway Loco Workshop	12 Days	
34	Ghadge H Sanjay	Central Railway Loco Workshop	12 Days	
35	Aditi Ravindra Chavan	Central Railway Loco Workshop	12 Days	
36	Saumya Ram Sharma	Central Railway Loco Workshop	12 Days	
35	Enrico Rodrigues	CEMS (CoE of Maritime & Shipbuilding)	1 Month	
38	Aditya D. Pandit	CEMS (CoE of Maritime & Shipbuilding)	1 Month	
39	Prem Abhijit Murade	Jadhao Gears Limited	45 Days	
40	Aqdas Siddiqui	Scientific Devices	45 Days	
41	Janhavi Sandesh Pande	Traction Machine Workshop	45 Days	

Page 26



DEPARTMENT OF MECHANICAL ENGINEERING, SPCE Mumbai

Campus Placements and Higher Studies

A total of 40 students opted for the campus placement during AY 2024-25.

Sr. No.	Name of Students	Company Name
01	Shreya Pravin Bhatt	SCHNEIDER ELECTRIC
02	Saif Salim Mozawala	BURNS AND MCDONNELL
03	Sanket Lahanu Bhusari	BURNS AND MCDONNELL
04	Aakash Hatimkar	BURNS AND MCDONNELL
05	Shivam Dasharath Rane	THE INNOVATION STORY
06	Jai Mahesh Nigudkar	ICICI BANK LTD.
07	Aryan Samrat Shah	BLUE STAR LTD
08	Rushit Khorana	BLUE STAR LTD
09	Vatsal Ketan Gandhi	BLUE STAR LTD
10	Trisharan Ninaji Ingle	BLUE STAR LTD
11	Tejas Rathik Mhatre	SHAPOORJI PALLONJI
12	Abhishek Kamal Maity	SHAPOORJI PALLONJI
13	Siddhant Amitabh Dube	MAHANAGAR GAS LIMITED
14	Akash Samadhan Kamble	MAHANAGAR GAS LIMITED
15	Shreyash Waindeshkar	MAHANAGAR GAS LIMITED
16	Archish Anil Shinde	AXIS BANK LTD
17	Darsh V. Jogani	AXIS BANK LTD
18	Shivam Anil Singh	TATA POWER COMPANY LTD.
19	Soumil Santosh Bagwe	PANASONIC LIFE SOL.INDIA PVT. LTD.
20	Yuvraj Brahmankar	OBEROI REALTY LIMITED
21	Nishita S. Nagwekar	THYSSENKRUPP
22	Rushika Manish Pagar	THYSSENKRUPP
23	Shrikant Gulab Rathod	TOYO ENGINEERING
24	Aaditya A. Gautam	TOYO ENGINEERING
25	Mandar Ragunath Patil	TOYO ENGINEERING

Page 27

Contraction of the second seco

Annual Report 2024-25

Campus Placements and Higher Studies

Sr. No.	Name of Students	Company Name
26	Deevi Usha Nikitha	TECNIMONT PRIVATE LIMITED
27	Sayali G. Kalyankar	TECNIMONT PRIVATE LIMITED
28	Dev G. Mandavgade	VOLTAS LIMITED
29	Varadraj Parmar	JIO WORLD CENTRE
30	Aditya Ramesh Pant	JIO WORLD CENTRE
31	Amisha Shailesh Gaud	JIO WORLD CENTRE
32	Sankalp Mali	R. K. CONTROLS INST. PVT. LTD
33	Indranil Prashnat Patil	R. K. CONTROLS INST. PVT. LTD
34	Suhaib Hamid Naikawadi	R. K. CONTROLS INST. PVT. LTD
35	Husnain Hameed Pathan	R. K. CONTROLS INST. PVT. LTD
36	Sai Satish Jaiswal	R. K. CONTROLS INST. PVT. LTD
37	Omkar Rajendra Repal	R. K. CONTROLS INST. PVT. LTD
38	Dinesh Asaram Dhage	RAYCHEM RPG
39	Gayatri Ramesh Tharkar	RAYCHEM RPG
40	Sohit Harendra Sinha	H & K ROLLING MILL ENG. PVT. LTD

Students Going for Higher Studies

1	Jash Saraiya	Northeastern University, Boston (USA)
2	Vishva Shah	Purdue University, West Lafayette
3	Dhwanit Vartak	Germany
4	Atharv Gawde	Germany or USA



DEPARTMENT OF MECHANICAL ENGINEERING, SPCE Mumbai

Doctoral Research Highlights

Ph.D. Research Achievements (2024–25)

The Department of Mechanical Engineering takes pride in the successful completion and defense of doctoral research by its scholars under the guidance of esteemed faculty members.

Successfully Defended Ph.D. Theses:

Scholar	Tesis Title	Supervisor
Mr. Mangesh Ahire	Modeling Leagile Supply Chain Management	Dr. S. B. Rane
Mr. Sachit Nalaskar	Modeling a New Product: A Lean and Green Perspective	Dr. S. B. Rane
Mr. Sanket Chaudhari	Synthesis and Development of Generalized Design Plan for Industrial Process Heaters	Dr. K. S. Bhole
Mr. Sachin Oak	Experimental Investigation of Lifting Hele-Shaw Cell for Fabrication of Net-shaped Structures	Dr. K. S. Bhole
Ms. Swati Donde	Numerical and Experimental Investigation of Thermal Performance of an Earth Air Heat Exchanger	Dr. R. S. Maurya
Mr. Yogeshrao More	Digital Manufacturing Practices in Indian Automotive Sector to Improve Productivity in Alignment with Industry 4.0	Dr. Rajesh B. Buktar
Mr. Tushar Bhoite	IoT Integration in Indian Auto Component Manufacturing Enterprises to Improve Productivity - An Industry 4.0 Initiative	Dr. Rajesh B. Buktar

List of Enrolled Ph.D. Scholars and Assigned Research Supervisors

Sr. No.	Name of PhD Scholar	Supervisor
1	Ms. Reshma Ramakant Bansar	Dr. Balwant N. Bhasme
2	Mr. Chiras Kedar Kale	Dr. Santosh Rane
3	Mr. Abhishek Jitendra Patil	Dr. Santosh Rane
4	Ms. Trupti Jagannath Navathale	Dr. Balwant N. Bhasme
5	Mr. Sankalp Sanjay Aswale	Dr. Rajesh B. Buktar
6	Mr. Shinde Harshvardhan Anil	Dr. Megha Janbandhu

A COLLEGE CITICAL

DEPARTMENT OF MECHANICAL ENGINEERING, SPCE Mumbai

Annual Report 2024-25

Inspiring Journeys: Our Students, Our Pride



Page 30



DEPARTMENT OF MECHANICAL ENGINEERING, SPCE Mumbai

Inspiring Journeys: Our Students, Our Pride





