



***Modern Education Society's
Wadia College of Engineering,
Pune.***

*Affiliated to SPPU , Approved by AICTE
Accredited by NBA & NAAC with
“A ++” Grade*

***Department of Mechanical
Engineering***

***“MechVision”
Technical Magazine***

***Academic Year
2022-23***



About the Institute

Modern Education Society is established in 1932 with the motto "For the Spread of Light". M.E.S. College of Engineering established in 1999 and situated in the heart of Pune city, offers engineering degree courses in Mechanical, E&TC and Computer Engineering and is affiliated to Savitribai Phule Pune University, accredited by NBA and NAAC with „A" Grade.

• UG COURSES:

Computer Engineering Intake - 180

Electronics & Telecommunication Engineering Intake - 120

Mechanical Engineering Intake – 120

Automation and Robotics Engineering Intake -60

• PG COURSES:

ME in Mechanical Engineering Design Intake - 24

ME in Signal Processing Intake - 12

ME in Computer Engineering Intake – 12

Vision of Institute:

To Groom - Motivated, Environment friendly, Self-esteemed, Creative and Oriented Engineers.

Mission of Institute:

To Develop Industry Oriented Manpower to accept the challenges of Globalization by,

- Promoting Value Education through motivated trained faculty
- Maintaining conducive environment for education at affordable cost,
- Promoting Industry Institute interaction,
- Involving alumni.

About the Department

The Department of Mechanical Engineering is striving hard since its inception in 1999 with highly qualified and energetic faculties for the all-round development of the budding engineers for the tomorrow's nation building. The department is accredited by NBA for three years (2018-2021). The department is well equipped with state-of-the-art facility in CAD/CAM, I C engine, Heat Transfer, Refrigeration and Air Conditioning, Fluid Mechanics and Fluid Machineries etc. We have center of excellence in emerging areas of mechanical engineering like 3D Printing lab (Under MODROB), NI Lab, Industrial Tribology Lab, Robotics Lab and Baker's MQC Lab which help student from institute and outside institute to conduct their research work. The leadership and team building qualities, environmental consciousness of our students are nurtured through membership and participation in various events organized by SAE India, Renewable Energy Club and MESA.

Vision of Department:

To groom Motivated, Environmental friendly, Self-esteemed, Creative and Oriented Mechanical Engineers.

Mission of Department:

To Develop Industry Oriented Manpower to accept the challenges of Globalization by,

- Imparting mechanical engineering knowledge through trained faculty in conducive environment.
- Creating awareness about the needs of mechanical industries through alumni and industry-institute interactions.
- Encouraging them to think innovatively and introduce them to various research activities.
- Supporting them to groom in all aspects like communication, interpersonal skills.

Program Educational Objectives:

- I. To prepare students with strong foundation in mathematical, scientific and engineering fundamentals that will enable them to have successful career in Mechanical and Interdisciplinary Industries
- II. To prepare students for rapid technological change equipped with strong conceptual understanding of core and basic concepts of mechanical engineering
- III. To enable students to develop their knowledge and skills across the range of disciplines.
- IV. To prepare students for soft skills with good communication, ethical values and ability to work in a team
- V. To prepare students to strengthen their knowledge and skills through self-learning abilities throughout their professional career as well as to pursue higher education.

Program Outcomes (PO):

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 teamwork:** 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.
13. **PSO I:** Apply principles of machine design, manufacturing, thermal engineering and management to identify, formulate and solve real life problems in various fields of engineering
14. **PSO II:** Use modern modeling, simulation techniques and computational tools.
15. **PSO III:** Develop practical solutions for mechanical engineering problems/processes under professional and ethical constraints.

Center of Excellence Labs



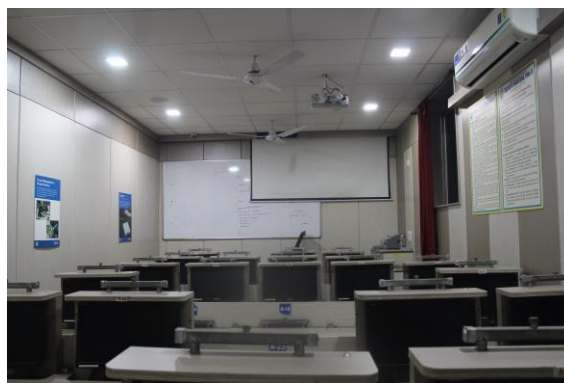
3 D Printing Lab



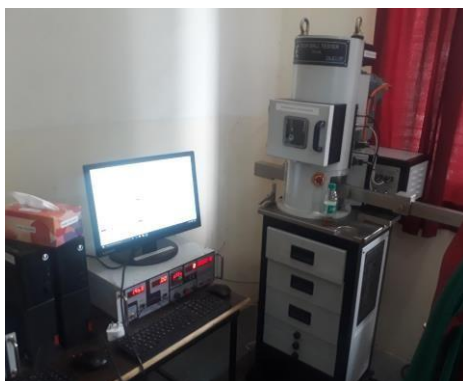
Advance Manufacturing Lab



Robotics Lab



NI Lab



Industrial Tribology Lab



Baker's MQC Lab

Dear Readers,

It is with great pleasure that I welcome you to this edition of **MechVision**, the official technical magazine of the **Department of Mechanical Engineering**. This platform continues to serve as a vibrant canvas for the creativity, curiosity, and technical acumen of our students, faculty, and alumni.

Mechanical Engineering, long regarded as the backbone of innovation, is evolving rapidly. From robotics and additive manufacturing to sustainable energy systems and computational mechanics, the field is expanding in both depth and scope. This magazine aims to reflect that dynamism by showcasing the groundbreaking work and fresh ideas emerging from our department.

In this issue, you will find a blend of research articles, project highlights, technical case studies, and opinion pieces. We feature cutting-edge developments such as the integration of AI in predictive maintenance, experimental fluid dynamics studies, and the use of simulation tools in thermal system design. Our student contributors have also explored real-world applications through industry internships and interdisciplinary projects.

Beyond technical content, MechVision also celebrates the human side of engineering—interviews with inspiring alumni, faculty achievements, student milestones, and department initiatives that foster innovation and collaboration.

As we continue to push boundaries in mechanical engineering, this magazine stands as a testament to our department's commitment to excellence, learning, and progress. I extend my sincere thanks to all contributors, reviewers, and the editorial team whose dedication has brought this publication to life.

We hope this edition informs, inspires, and invites you to be part of the ever-evolving story of mechanical engineering.

Warm regards,

Dr.V.N.Raibhole

Head

Department of Mechanical Engineering

Dr.S.H.Gawande

Assoc.Professor

Department of Mechanical Engineering

Mr.Sushant S.Jadhav

Asst.Professor

Department of Mechanical Engineering

Mr.P.V.Bute

Asst..Professor

Department of Mechanical Engineering

M. E. S. College of Engineering, Pune. Department of Mechanical Engineering Number of 'per teacher in the Journals notified on UGC website during the last five years											
Academic Year	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal /Digital Object Identifier (doi) number			Citations	
							Link to website of the Journal	Link to article/paper/abstract of the article	Is it listed in UGC Care list/Scopus/Web of Science/other		
Dr. Vikas Chougule											
2022-23	Development of reverse-phase high-performance liquid chromatographic and UV- Spectrophotometric method with validation for octadine dihydrochloride	Vikas Chougule, Manjiri Rajmane, Nilesh Chougule, Abhishek Desai, Vinayak Rohile, Nasruddin Inamdar	Mechanical	American Journal of Pharmtech Research	2022	ISSN: 2249-3387	https://www.ajptr.com/	/ajptr.com/assets/upload/publish_article/AJPTR12301	Google Scholar	1	
2022-23	Classification of damages in composite material using multi-support vector machine	B Rajiv, Pritam Kalos, Prakash Pantawane, Vikas Chougule, Vishwanath Chavan	Mechanical	Journal of The Institution of Engineers (India): Series C	2022	Print ISSN: 2250-0545	https://link.springer.com/journal/40032	https://doi.org/10.1007/s40032-022-00811-1.pdf	Scopus	4	
Dr. Vajjanath Raibhole											
2022-23	Numerical assessment of thermal performance of heated air duct with novel arc profile ribs in non-interrupted arrangement	Harshad Deshpande, Vajjanath Raibhole	Mechanical	Materials Today: Proceedings	2022	ISSN: 2214-7853	https://www.sciencedirect.com/journal/materials-today-proceedings	https://doi.org/10.1016/j.matpr.2021.11.534	Scopus	4	
2022-23	Cascade refrigeration system with environment friendly refrigerants as R290 and ammonia	VN Raibhole, DA Kamble	Mechanical	International Journal of Environmental Engineering	2022	ISSN (print): 1756-8463	https://www.inderscienceonline.com/journal/ijee	https://doi.org/10.1504/IJEE.2022.128070	Google Scholar	1	
2022-23	Design, development and analysis of onion cold storage system	Mukund Joshi, Aniket Choudhari, Omkar Dixit, Mayuri Yadav, VN Raibhole, Harshad Deshpande	Mechanical	AIP Conference Proceedings	2022	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0080344	Scopus	3	
2022-23	Review on the use of various blends of soybean oil-based biodiesel in CI engine	Mrunal Vaman Yadav, SY Bhosale, HN Deshpande, VN Raibhole	Mechanical	AIP Conference Proceedings	2022	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0080347	Scopus	1	
Dr. SH Gawande											
2022-23	Multi-response design optimisation of convolution stresses of metal bellows using integrated PCA-GRA approach	ND Pagar, SH Gawande	Mechanical	Australian Journal of Mechanical Engineering	2022	Print ISSN: 1448-4846	https://www.tandfonline.com/doi/tmec20	https://doi.org/10.1080/14484846.2020.1725347	WoS (ESCI), Scopus	17	
2022-23	Biodiesel production from DK oils using Taguchi L9 techniques: characterization and thermogravimetric study of combustion characteristics	Ganesh Vijay More, YV Hanumantha Rao, SA Kedar, SH Gawande	Mechanical	Journal of thermal analysis and calorimetry	2022	Print ISSN 1388-6150	https://link.springer.com/journal/10973	https://doi.org/10.1007/s10973-021-11020-w	WoS (SCIE), Scopus	9	
2022-23	Wet sliding wear behavior of EN31 rolling contact bearings for screw compressor application with statistical analysis	SH Gawande, Ketan Raykar	Mechanical	Tribologia-Finnish Journal of Tribology	2022	ISSN 0780-2285	https://journal.fi/tribologia	https://doi.org/10.30678/ft.109837	WoS (ESCI), Scopus	2	
2022-23	Study of Wear Behavior with Statistical Analysis of Rolling Contact Bearings for Screw Compressor	SH Gawande, KA Raykar, KH Munde	Mechanical	Journal of Bio-and Tribo-Corrosion	2022	Print ISSN 2198-4220	https://link.springer.com/journal/40735	https://doi.org/10.1007/s40735-022-00701-0	Scopus		
2022-23	Heat transfer augmentation in a circular tube fitted with tri-partition flow splitters	VS Chandratre, AA Keste, NK Sane, SH Gawande	Mechanical	International Journal of Ambient Energy	2022	ISSN 2162-8246 (Online)	https://www.tandfonline.com/journals/taen20	https://doi.org/10.1080/01430750.2021.1922499	Scopus		
Dr. Anirban C Mitra											
2022-23	Comparative analysis of passive and semi-active suspension system for different road profiles by using Matlab/Simulink	Shital V Pol, Anirban Mitra, Rahul Yerrawar	Mechanical	AIP Conference Proceedings	2022	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0080309	Scopus	3	
2022-23	Development of virtual laboratories--An evolution of traditional laboratories	Anirban Mitra, Aniket Gawande, Ketan Chaudhari, Prasad Lokhande, Himanshu Aate	Mechanical	AIP Conference Proceedings	2022	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0080399	Scopus	2	
2022-23	Development and analysis of passive suspension model with half sine wave road bump for different suspension parameters	Anirban C Mitra, Ajay Rajput, Vinay Satish, Shubhali Mhatre	Mechanical	AIP Conference Proceedings	2022	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0080400	Scopus	4	
Dr. V. J. Sonawane											
2022-23	Synthesis of anthropomorphic fingers for robotic hands	Akash Lawand, Suhas S Jadhav, Sushant S Jadhav, Vaishali J Sonawane	Mechanical	AIP Conference Proceedings	2022	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0157122	Scopus		
Dr. A. R. Patil											
2022-23	Design and development of 360 degree welding turn table with scissor height adjuster	Bhushan Nandre, Neha Salunkhe, Swaraj Bhure, Amit Patil	Mechanical	AIP Conference Proceedings	2022	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0080464	Scopus		
2022-23	Experimental investigation on the effect of optimized dimethyl carbonate on CI engine performance & Emissions at various engine operating parameters using Taguchi method	Amit R Patil, Rupa S Bindu, Avinash M Pawar, Nitin D Pagar, Bhushan D Nandre	Mechanical	AIP Conference Proceedings	2022	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0080194	Scopus	7	
2022-23	Normal and shear stress distributed points on thin walled corrugated tubes by conformal transformation technique	Nitin D. Pagar, Bhumeswar M Patle, Amit R Patil, Santosh A Darade	Mechanical	AIP Conference Proceedings	2022	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0080353	Scopus	1	
2022-23	Biodiesel Fueled Engine Vibration Studies by Taguchi Method and Results Validation by ANN	R. R. Arakerimath Satish A. Patil, Amit R. Patil, Bhupendra S. Patil, Dipak S. Patil	Mechanical	International Journal of Mechanical Engineering	2022				Google Scholar		
2022-23	A review on Industry 5.0: The techno-social revolution	AR Patil, K Thakur, K Gandhi, V Savale, N Sayyed	Mechanical	International Journal of Mechanical Engineering	2022				Google Scholar	10	
Prof. S. S. Jadhav											
2022-23	Synthesis of anthropomorphic fingers for robotic hands	Akash Lawand, Suhas S Jadhav, Sushant S Jadhav, Vaishali J Sonawane	Mechanical	AIP Conference Proceedings	2022	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0157122	Scopus		
Dr K.A.Mahajan											
2022-23	Tool vibration effect on surface roughness of polymethylmethacrylate in diamond turning	Kuldeep A Mahajan, Raju S Pawade, Vinod Mishra	Mechanical	Materials and Manufacturing Processes	2022	ISSN 1532-2475	https://www.tandfonline.com/journals/mmj20	https://doi.org/10.1080/10426914.2021.1973029	WoS (SCIE), Scopus	11	
Dr.Rahul N. Yerrawar											
2022-23	Comparative analysis of passive and semi-active suspension system for different road profiles by using Matlab/Simulink	Shital V Pol, Anirban Mitra, Rahul Yerrawar	Mechanical	AIP Conference Proceedings	2022	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0080309	Scopus	3	
2022-23	Experimental Investigation and Micro Structural Variation in Friction Drilling on AISI 1015 Low Carbon Steel, AISI 1008 Aluminium and Copper by Using Tungsten Carbide Tool	Vinayak W Bembrekar, Rahul N Yerrawar	Mechanical	Techno-Societal 2016, International Conference on Advanced Technologies for Societal Applications	2022	978-3-031-34644-6	https://link.springer.com/book/10.1007/978-3-031-34644-6	https://doi.org/10.1007/978-3-031-34644-6_58	Scopus		
Dr.Bhushan Nandre											
2022-23	Design and development of 360 degree welding turn table with scissor height adjuster	Bhushan Nandre, Neha Salunkhe, Swaraj Bhure, Amit Patil	Mechanical	AIP Conference Proceedings	2022	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0080464	Scopus		
2022-23	Experimental investigation on the effect of optimized dimethyl carbonate on CI engine performance & Emissions at various engine operating parameters using Taguchi method	Amit R Patil, Rupa S Bindu, Avinash M Pawar, Nitin D Pagar, Bhushan D Nandre	Mechanical	AIP Conference Proceedings	2022	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0080194	Scopus	7	
2022-23	The effects of hardness of different impacting particles and target materials on slurry erosion wear	Bhushan D Nandre, Dhnanjay W Patil, Girish R Desale	Mechanical	AIP Conference Proceedings	2022	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0081108		1	
Dinesh R. Salunke											
2022-23	Investigations on tensile and flexural behaviors of sugarcane fiber/boron nitride/fly ash reinforced polymer matrix composite	Pradhyumn Bhardwaj, Rohit Omprakash Panjabli, Omkar Ashok Nade, Venkatachalam Gopalan, Vignesh Pragasam, Dinesh Ramesh Salunke	Mechanical	Polymer Composites	2022	Print ISSN:0272-8397	https://4spepublications.onlinelibrary.wiley.com/journal/15480569	https://doi.org/10.1002/pc.26492	WoS (SCIE), Scopus	9	
2022-23	Investigation of electrical resistance and dielectric constant of Boron Nitride and Banana fiber reinforced epoxy polymer matrix composite	Dinesh R Salunke, Venkatachalam Gopalan	Mechanical	Polymers and Polymer Composites	2022			https://doi.org/10.1063/5.0110542	WoS (SCIE), Scopus	4	
2022-23	Development of a non-humanoid robot for hospitality	Samak Devavrat, Dinesh Salunke	Mechanical	AIP Conference Proceedings	2022	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp		Scopus		
2022-23	Thermal conductivity of boron nitride/banana fiber reinforced epoxy hybrid composites	Dinesh Ramesh Salunke, Venkatachalam Gopalan	Mechanical	Journal of Natural Fibers	2022	Print ISSN: 1544-0478	https://www.tandfonline.com/journals/wjnf20	https://doi.org/10.1080/15440478.2021.1966568	WoS (SCIE), Scopus	3	
2022-23	Study on tensile properties of fly ash, sugarcane fiber and carbon nanotube-reinforced polymer matrix composite using objective evolutionary algorithm	Gopalan Venkatachalam, Arunkumar Gopu, Pitchumani Shenbaga Velu, Neelamarayan Venkataraman, Dinesh Ramesh Salunke, Raghava Rao Mukkamala	Mechanical	Nanomaterials	2022	ISSN: 2079-4991	https://www.mdpi.com/journal/nanomaterials	https://doi.org/10.3390/nano12234112	WoS (SCIE), Scopus	7	