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 2023-24

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:

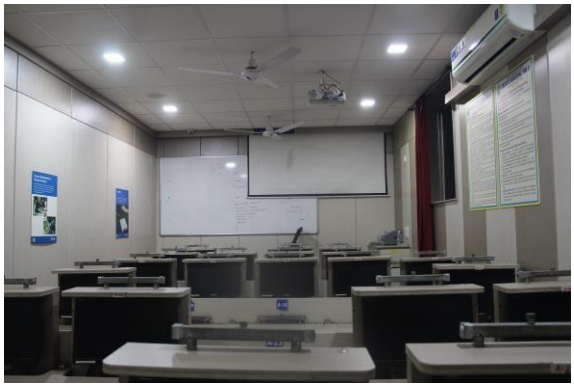
1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching 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 papers published 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			Citetations
							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										
2023-24	Design and Analysis of Automated Solar Panel Cleaning System	AMIT R. PATIL, V. N. CHOUGULE	Mechanical	Current World Environment An International Research Journal of Environmental Science	2023	ISSN:0973-4929	http://www.cwejournal.org/	http://dx.doi.org/10.12944/CWE.18.3.11	E-CARE Journal, Google Sch	2
2023-24	Experimental and Finite Element Analysis of 3D Printed Parts for Characterisation of Their Mechanical Behaviour	V. N. Chougule P. N. Jumle, B. B. Ahuja, A. V. Mulay	Mechanical	International Journal of INTELLIGENT SYSTEMS AND APPLICATIONS IN ENGINEERING	2023	ISSN:2147-6799	https://ijisae.org/index.php/IJISAE	https://ijisae.org/index.php/IJISAE/article/view/6490/5327	Google Scholar	
Dr. Vaijanath Raibhole										
2023-24	Heat transfer analysis of rhombus shaped pin fins array of heat sink for improved heat transfer rate.	Ram Deshmukh, VN Raibhole	Mechanical	AIP Conference Proceedings	2023	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0127834	Scopus	
2023-24	An extensive review on effect of use of different vortex generators on thermal performance in various applications	Jitendra Chaubey, Harshad Deshpande, Sameer Bhosale, Vaijanath Raibhole	Mechanical	AIP Conference Proceedings	2023	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0157599	Scopus	1
2023-24	Influence of placement of ribs in solar air heater on it's overall thermal performance–A comprehensive review	Harshad Deshpande, Manjusha Barge, Vaijanath Raibhole, Sameer Bhosale	Mechanical	AIP Conference Proceedings	2023	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0171929	Scopus	
2023-24	Investigation of a natural convection heat transfer enhancement of a different shaped pin fin heat sink for different vertical fin spacing	Ram Deshmukh, VN Raibhole	Mechanical	Heat and Mass Transfer	2023	Print ISSN 0947-7411	https://link.springer.com/journal/231	https://doi.org/10.1007/s00231-023-03395-3	WoS (SCIE), Scopus	7
Dr. SH Gawande										
2023-24	Study on wear analysis of substitute automotive brake pad materials	Shravan H Gawande, AS Banait, K Balashowry	Mechanical	Australian Journal of Mechanical Engineering	2023	Print ISSN: 1448-4846	https://www.tandfonline.com/loi/tmec20	https://doi.org/10.1080/14484846.2020.1831133	WoS (ESCI). Scopus	16
2023-24	Metal matrix nanocomposites: A brief overview	Prashil U Sarode, Jhantu G Raul, Aditya S Gaikwad, Shravan Gawande	Mechanical	Nanoscience & Nanotechnology-Asia	2023	ISSN: 2210-6812	https://www.benthamdirect.com/content/journals/nanoasi	https://doi.org/10.2174/2210681213666230301152349	Scopus	4
2023-24	Study the effect of geometric parameters on heat transfer in metal expansion bellows using taguchi method	Sunil Wankhede, Shravan H Gawande	Mechanical	Recent Advances in Material, Manufacturing, and Machine Learning	2023	eBook ISBN 9781003370628	https://www.taylorfrancis.com/		Google Scholar	1
2023-24	Half Width & Phasing Method for reduction of Instabilities of Mesh Stiffness Variation in Two-Stage Gear	SH Gawande, VV Palande	Mechanical	Australian Journal of Mechanical Engineering	2023	Print ISSN: 1448-4846	https://www.tandfonline.com/loi/tmec20	https://doi.org/10.1080/14484846.2021.1914889	WoS (ESCI). Scopus	
2023-24	Design and analysis aspect of metal expansion bellows: A review	SD Wankhede, SH Gawande	Mechanical	Forces in Mechanics	2023	Online ISSN: 2666-3597	https://www.sciencedirect.com/journal/forces-in-mechanics	https://doi.org/10.1016/j.finmec.2023.100244	WoS (ESCI). Scopus	13
Dr. Anirban C Mitra										
2023-24	Object following robot based on AI/ML	Anand Kamble, Anirban C Mitra, Aniket Tathe, Suyash Kumbharkar, Atharva Bhandare	Mechanical	Materials Today Proceeding	2023	ISSN: 2214-7853	https://www.sciencedirect.com/journal/materials-today-proceedings	https://doi.org/10.1016/j.matpr.2022.09.577	Scopus	1
2023-24	Performance enhancement of PID assisted semi-active suspension system and optimization using Taguchi method and grey relational analysis	Shital V Pol, Anirban C Mitra, Rahul N Yerrawar	Mechanical	AIP Conference Proceedings	2023	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0157733	Scopus	
2023-24	Custom Data Augmentation for low resource ASR using Bark and Retrieval-Based Voice Conversion	Anand Kamble, Aniket Tathe, Suyash Kumbharkar, Atharva Bhandare, Anirban C Mitra	Mechanical	arXiv preprint arXiv:2311.14836	2023	ISSN 2331-8422 (Online)	https://arxiv.org/list/cs.CL/2023-11?skip=1300&show=100	https://doi.org/10.48550/arXiv.2311.14836	Google Scholar	1
2023-24	End to end Hindi to English speech conversion using Bark, mBART and a finetuned XLSR Wav2Vec2	Aniket Tathe, Anand Kamble, Suyash Kumbharkar, Atharva Bhandare, Anirban C Mitra	Mechanical	arXiv preprint arXiv:2311.14836	2023	ISSN 2331-8422 (Online)	https://arxiv.org/list/cs.CL/2023-11?skip=1300&show=100	https://doi.org/10.48550/arXiv.2401.06183	Google Scholar	1
2023-24	Transcription and translation of videos using fine-tuned XLSR Wav2Vec2 on custom dataset and mBART	Aniket Tathe, Anand Kamble, Suyash Kumbharkar, Atharva Bhandare, Anirban C Mitra	Mechanical	arXiv preprint arXiv:2311.14836	2023	ISSN 2331-8422 (Online)	https://arxiv.org/list/cs.CL/2023-11?skip=1300&show=100	https://doi.org/10.48550/arXiv.2403.00212	Google Scholar	2
2023-24	Real-time road testing and analysis of adjustable passive suspension system with variable spring stiffness	CD Kulkarni, PP Sail, AV Kalaskar, AC Mitra, SH Gawande	Mechanical	JMST Advances	2023	Print ISSN 2524-7905	https://link.springer.com/journal/42791	https://doi.org/10.1007/s42791-024-00082-0	Google Scholar	1
2023-24	Experimental investigation of the effect of welding parameters on material properties of SS 316L stainless steel welded joints	Rameshwar V Chavan, Anirban C Mitra	Mechanical	International Journal of Steel Structures	2023	Print ISSN 1598-2351	https://link.springer.com/journal/13296	https://doi.org/10.1007/s13296-024-00874-z	WoS (SCIE), Scopus	1
Dr. A. R. Patil										
2023-24	Modelling erosive wear of nano-filler added carbon fibre reinforced polymer composite by artificial neural networks	SDS Abhiram Kalvakolanu, Sai Krishna Prashanth Kolluru, Uma Maheshwera Reddy Paturi, AR Patil	Mechanical	Materials Today: Proceedings	2023	ISSN: 2214-7853	https://www.sciencedirect.com/journal/materials-today-proceedings	https://doi.org/10.1016/j.matpr.2023.01.203	Scopus	6
2023-24	Preface: 10th National Conference on Recent Developments in Mechanical Engineering [RDME 2022]	Amit R Patil, Bhushan D Nandre, Vikas N Chougule	Mechanical	AIP Conference Proceedings	2023	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp		Scopus	
2023-24	Efficient Power Generation In Electric Vehicles: A Chain Gear Ratio Approach	R Soujanya, Bansilal Bairwa, BS Sagar, Sameer Sharma, Amit R Patil	Mechanical	2023 IEEE 2nd International Conference on Industrial Electronics: Developments & Applications (ICIDeA)	2023	ISBN (Online): 979-8-3503-8197-9	https://www.proceedings.com/content/071/071142webtoc.pdf	ps://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=102952	Scopus	
Prof. S. D. Wankhede										
2023-24	Study the effect of geometric parameters on heat transfer in metal expansion bellows using taguchi method	Sunil Wankhede, Shravan H Gawande	Mechanical	Recent Advances in Material, Manufacturing, and Machine Learning	2023	eBook ISBN 9781003370628	https://www.taylorfrancis.com/		Google Scholar	1
2023-24	Design and analysis aspect of metal expansion bellows: A review	SD Wankhede, SH Gawande	Mechanical	Forces in Mechanics	2023	Online ISSN: 2666-3597	https://www.sciencedirect.com/journal/forces-in-mechanics	https://doi.org/10.1016/j.finmec.2023.100244	WoS (ESCI). Scopus	13
Dr.Rahul N. Yerrawar										
2023-24	Numerical modeling of semi-automatic washing machine motion model	SG Nilawar, RN Yerrawar	Mechanical	AIP Conference Proceedings	2023	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0168215	Scopus	
2023-24	Performance enhancement of PID assisted semi-active suspension system and optimization using Taguchi method and grey relational analysis	Shital V Pol, Anirban C Mitra, Rahul N Yerrawar	Mechanical	AIP Conference Proceedings	2023	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0157733	Scopus	
Prof. H. S. Salave										
2023-24	Numerical analysis of a single cylinder stationary diesel engine using enriched biogas	HS Salave, AD Desai	Mechanical	Materials Today: Proceedings	2023	ISSN: 2214-7853	https://www.sciencedirect.com/journal/materials-today-proceedings	https://doi.org/10.1016/j.matpr.2022.09.455	Scopus	2
Dr.Bhushan Nandre										
2023-24	Investigation on the Effect of Contact Area and Stress Concentration on Slurry Erosion Wear of AA6063 using Hertz contact theory and Numerical Technique.	Bhushan D Nandre, Girish R Desale	Mechanical	Tribology in Industry	2023	ISSN 0354-8996	https://www.tribology.rs/	https://doi.org/10.24874/ti.1433.01.23.05	Scopus	1
2023-24	Preface: 10th National Conference on Recent Developments in Mechanical Engineering [RDME 2022]	Amit R Patil, Bhushan D Nandre, Vikas N Chougule	Mechanical	AIP Conference Proceedings	2023	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp		Scopus	
Prof. Sushant. 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	2023	Print ISSN 0094-243X	https://pubs.aip.org/aip/acp	https://doi.org/10.1063/5.0157122	Scopus	
Dr. Sachin R Kandharkar										
2023-24	Development of distributed compliant mechanism for two distinct applications: displacement amplifying and object holding mechanism	Sachin R Kandharkar, Sujit S Pardeshi, Rohan Soman, Abhishek D Patange, Wieslaw Ostachowicz	Mechanical	Engineering Research Express	2023	ISSN: 2631-8695	https://iopscience.iop.org/journal/2631-8695	https://doi.org/10.1088/2631-8695/acd520	Scopus	1