



ಬಿ.ಎಂ.ಎಸ್. ತಾಂತ್ರಿಕ ಮತ್ತು ವ್ಯವಸ್ಥಾಪನಾ ಮಹಾವಿದ್ಯಾಲಯ  
(ವಿ.ಟಿ.ಯು. ಅಡಿಯಲ್ಲಿನ ಸ್ವಾಯತ್ತ ಸಂಸ್ಥೆ)

**BMS** INSTITUTE OF TECHNOLOGY & MANAGEMENT  
(Autonomous Under VTU)

Department of Mechanical Engineering



MECHINFO

# MECHINFO



MECHINFO

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BMS Educational Trust®



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VII SEMESTER  
Student Coordinator



**Miss. Prathijna**  
V SEMESTER  
Student Coordinator





## *Vision of the Institute*

To emerge as one of the finest technical institutions of higher learning to develop engineering professionals who are technically competent, ethical and environment friendly for betterment of the society.



## *Vision of the Department*

To establish a hub of excellence in diverse fields of mechanical engineering for research and innovation to meet the industrial and societal challenges.



## *Mission of the Institute*

Accomplish stimulating learning environment through high quality academic instruction, innovation and industry - institution interface.



## *Mission of the Department*

- Impart quality education in Mechanical Engineering and allied areas through teaching learning process and state of the art infrastructure.
- Provide a conducive environment to excel in research and Innovation for sustainable solutions through Industrial collaboration, co-curricular and extracurricular activities.'

## *Program Educational Objectives (PEOs)*

### **Graduates of the program will:**

PEO-1: Be successful professionals in the field of Mechanical Engineering and allied areas.

PEO-2: Exhibit skills to work effectively and ethically in multiple domains of engineering as part of team.

PEO-3: Excel in higher studies, research and adapt in a world of constantly developing technology.

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## HODs Desk



The Department of Mechanical Engineering stands as a beacon of academic distinction, having earned NBA accreditation—a prestigious recognition that underscores its steadfast dedication to maintaining high standards in education, research, and institutional quality. This achievement reflects the department's rigorous curriculum, continuous improvement practices, and alignment with national benchmarks for engineering education.

At the heart of the department is a team of highly accomplished faculty members, each holding a doctoral degree and bringing a wealth of expertise across diverse domains of mechanical engineering. Their scholarly contributions and mentorship foster a vibrant learning

The department fosters academic excellence through its highly qualified faculty, who create a rigorous and intellectually stimulating environment that promotes deep learning and critical thinking. A strong research-driven culture thrives within the department, with faculty actively engaged in cutting-edge investigations across areas such as materials science, vibration analysis, smart materials, alternative fuels, and solar energy. Complementing this scholarly pursuit is state-of-the-art infrastructure, including a dedicated Centre of Excellence in Automotive Engineering and robust industry collaborations established through MOUs, which facilitate joint research initiatives and immersive industrial internships. By seamlessly integrating academic rigor, research innovation, and industry engagement, the department ensures holistic student development, preparing graduates to excel in both professional and academic arenas.

With NBA accreditation, a highly qualified faculty, and world-class facilities, the department empowers students to become future-ready engineers. Its integrated approach combining rigorous academics, pioneering research, and real-world engagement ensures that graduates are not only technically proficient but also holistically developed to meet the evolving demands of the global engineering landscape.



## Faculty – Department of Mechanical



**Dr. Sanjay HA**

Principal & Professor



**Dr. Madhu M C**

Head of the Department

**Specialization :** Thermal  
Engineering and Renewable



**Dr. K.M Sathish Kumar**

Professor & Dean Academics

**Specialization :** Computer Integrated and  
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**Mr. T.N. Praveen Kumar**

Associate Professor

**Specialization :** BE in Mechanical



**Dr. O. Gurumurthy**

Assistant Professor

**Specialization :** Manufacturing Engineering





**Mr.K.Chandra Sekhara Reddy**

Assistant Professor

**Specialization** : Industrial Engineering



**Dr.G.L Anantha Krishna**

Assistant Professor

**Specialization:** Design Engineering



**Dr.Shripad Diwakar**

Assistant Professor

**Specialization** : Thermal Science &



**Mrs.Nithya Poornima**

Assistant Professor

**Specialization** : Computer Integrated and Manufacturing(CIM)



**Mr.Sriganesh T G**

Assistant Professor

**Specialization** : Computer Integrated and Manufacturing(CIM)



**Mr.Sundaresh.S**

Assistant Professor

**Specialization** : Product Design and Manufacturing



**Dr.Keerthi Kumar.N**

Assistant Professor

**Specialization** : Thermal Engineering, Renewable energy



**Mr.Kiran M D**

Assistant Professor

**Specialization** : Machine Design





**Dr.Y.J .Jagadeesh**

Assistant Professor

**Specialization** : Thermal Engineering



**Dr.G.Avinash**

Assistant Professor

**Specialization** : Thermal sciences –  
Thermodynamics & Combustion



**Dr.Nagamadhu.M**

Assistant Professor

**Specialization** : Machine Design



**Dr. Chethan D**

Assistant Professor

**Specialization** : Machine Design



**Dr. Srinidhi Acharya S R**

Assistant Professor

**Specialization** : Machine Design



**Dr. Manjunath**

Assistant Professor

**Specialization** : Machine Design



## TECHNICAL STAFF – DEPARTMENT OF MECHANICAL ENGINEERING



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**Mr.Ashok.G.C**

Assistant Instructor



**Mr.Srinivasa.K.A**

Assistant Instructor





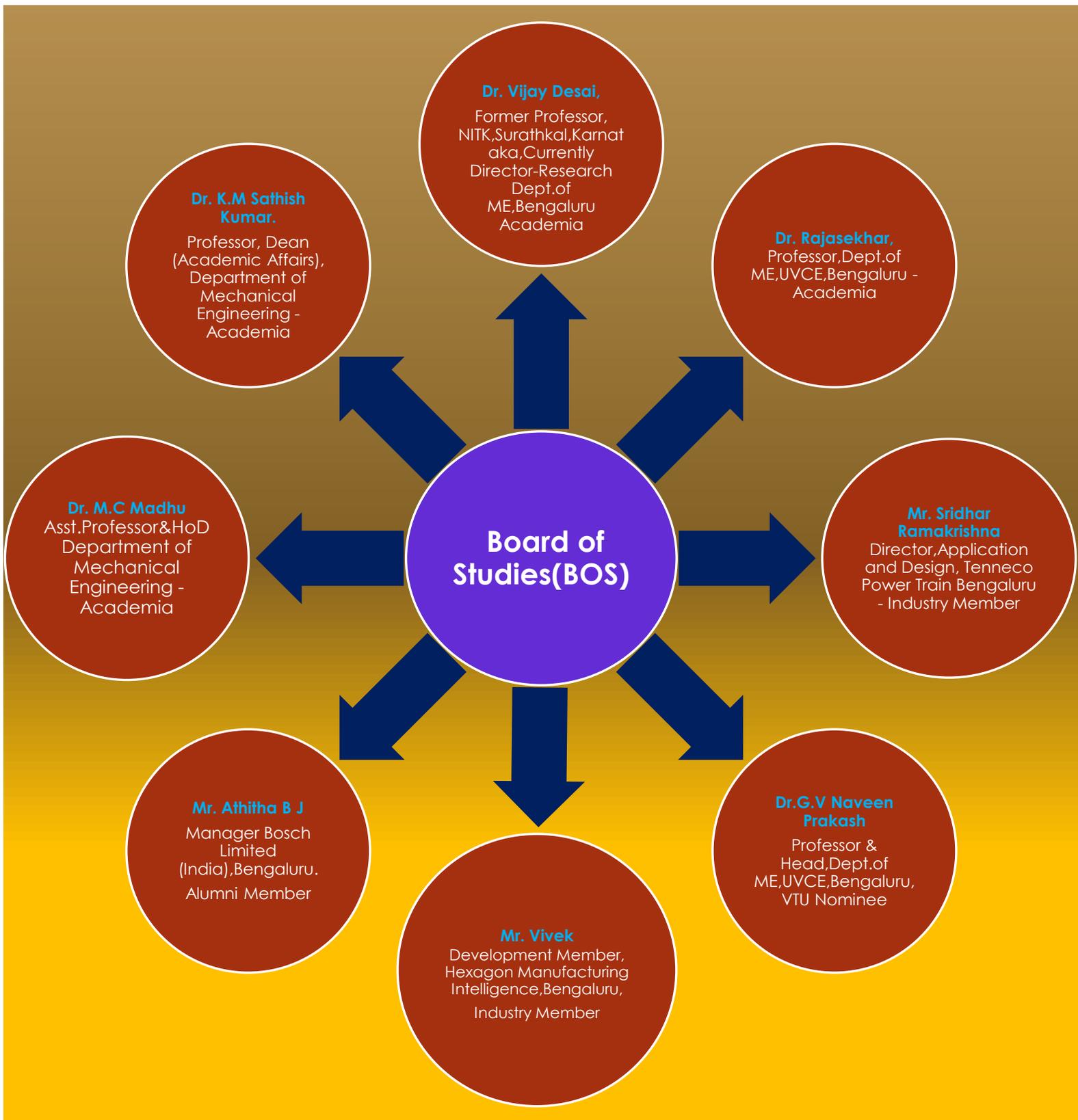
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**Mr. Shivaprasad T**  
Assistant Instructor



## BOARD OF STUDIES (BOS)



## **Journal Publication**

Prof S. Nithya Poornima, Assistant Professor, Dept of Mechanical Engineering published a paper titled “Experimental Investigation of the Characteristics and Tribological Effectiveness of Pongamia pinnata Lubricant Oil Blended with Nanoadditives” in Q2 journal in *Lubricants* 2025, 13(3),128; <https://doi.org/10.3390/lubricants13030128>.

Dr Manjunatha.C Assistant Professor, Dept of Mechanical Engineering published a paper titled “Development and mechanical characterisation of hybrid tungsten carbide/graphite reinforced aluminium metal matrix composites using deep learning techniques. *Canadian Metallurgical Quarterly*, Q2 journal 1–16. <https://doi.org/10.1080/00084433.2025.2498259>.

Dr. Shripad Diwakar, Assistant Professor, Department of Mechanical Engineering, BMS Institute of Technology and Management has published a research paper entitled “Experimental Investigations of Performance and Emission Characteristics on CI engine Fueled with Simaroubaglauca Biodiesel and its Blends” in *GIS Science Journal*, Volume 12, Issue 6, pp 442-448, publication link: <https://gisscience.net/volume-12-issue-6-2025/>

Dr. Nagamadhu.M, Assistant Professor, Department of Mechanical Engineering “Effect of Printing Parameters on Mechanical Properties and Warpage of 3D-Printed PEEK/CF-PEEK Composites Using Multi-Objective Optimization Technique” Q 1, <https://www.mdpi.com/2504-477X/9/5/208>

Dr. Nagamadhu.M, Assistant Professor, Department of Mechanical Engineering “Taguchi-Based Experimentation Technique in Combination with Multifactor Regression for Optimization of Refrigerants, Design and Process Parameters to Maximize Heat Transfer in Heat Pumps”, Q3, <https://link.springer.com/article/10.1007/s40032-025-01174-z>

Dr. Nagamadhu.M, Assistant Professor, Department of Mechanical Engineering “Comparative analysis of fly ash cenosphere and copper reinforcements in friction stir welded AA6082-T6 alloy”, Q2, <https://iopscience.iop.org/article/10.1088/2053-1591/addf18>

Dr. Nagamadhu.M, Assistant Professor, Department of Mechanical Engineering “Effect of Zirconium Silicate Reinforcement on Aluminum 7075; Mechanical Properties, Thermomechanical Analysis and Vibrational Behavior”, Q3, <https://www.mdpi.com/2673-4117/6/2/23>

Dr. Nagamadhu.M, Assistant Professor, Department of Mechanical Engineering “Performance studies on a solar PV-powered multi-stage cooling system”, Q2, <https://www.tandfonline.com/doi/full/10.1080/23311916.2024.2397497>



Dr. Nagamadhu.M, Assistant Professor, Department of Mechanical Engineering “Ultra-sensitive platform for the detection of a psychostimulant drug using a nanostructured titanium carbide/carbon matrix: Insights into electrochemical sensing mechanism”, Q1, <https://www.sciencedirect.com/science/article/abs/pii/S0254058425004432>

Dr. Nagamadhu.M, Assistant Professor, Department of Mechanical Engineering “Characterization and evaluation of joint properties of friction stir welded AA7075/GNPs joints obtained using square and cylindrical threaded tools”, Q1, <https://www.sciencedirect.com/science/article/pii/S2238785425011822>

Dr. Nagamadhu.M, Assistant Professor, Department of Mechanical Engineering “Evolution and recent advancements of composite materials in sports applications, Applications of Composite Materials in Engineering, Woodhead Series”, in Materials, Elsevier. <https://www.sciencedirect.com/science/article/abs/pii/B9780443139895000097>, Book Chapter

Dr. Nagamadhu.M, Assistant Professor, Department of Mechanical Engineering “Agricultural wastes for production of biochar\_Biochar Production Engineering - Innovative Technology for Environmental Decontamination, Biochar”, Production Engineering - Innovative Technology for Environmental Decontamination, Book Chapter, [https://link.springer.com/chapter/10.1007/978-3-031-92594-8\\_3](https://link.springer.com/chapter/10.1007/978-3-031-92594-8_3)

Dr. Nagamadhu.M, Assistant Professor, Department of Mechanical Engineering “Polymer cation exchange sorbents for the removal of heavy metal ions”, Book Chapter <https://www.springerprofessional.de/en/polymer-cation-exchange-sorbents-for-the-removal-of-heavy-metal-/51230088>

Dr. Nagamadhu.M, Assistant Professor, Department of Mechanical Engineering “Activated carbon and polymeric ion exchange sorbents for metaldehyde elimination”, Book Chapter [https://link.springer.com/chapter/10.1007/978-981-96-3989-2\\_14#:~:text=In%20this%20chapter%2C%20the%20studies,du%20to%20their%20specific%20properties.](https://link.springer.com/chapter/10.1007/978-981-96-3989-2_14#:~:text=In%20this%20chapter%2C%20the%20studies,du%20to%20their%20specific%20properties.)

Dr. Nagamadhu.M, Assistant Professor, Department of Mechanical Engineering “Composite Ion Exchange Sorbents: Development, Properties and Applications” Book Chapter, [https://link.springer.com/chapter/10.1007/978-981-96-3989-2\\_16#:~:text=Composite%20ion%20exchangers%20with%20tailored,radioactive%20isotope%20separation%2C%20and%20large%2D](https://link.springer.com/chapter/10.1007/978-981-96-3989-2_16#:~:text=Composite%20ion%20exchangers%20with%20tailored,radioactive%20isotope%20separation%2C%20and%20large%2D)



## Faculty Development Program

Prof S Nithya Poornima and Dr Manjunath.C Assistant Professor, Department of Mechanical Engineering Attended One-Week Faculty Development Program On “Recent Advances and Innovations in Multi-Disciplinary Composite Materials” (RAIMCM-2025) August 18-23, 2025 at Ramaiah Institute of Technology

Dr Chethan.D Assistant Professor, Department of Mechanical Engineering Attended Five-Days Faculty Development Program on AI- Powered Robotics in Industrial Automation Application at BGS college of Engineering and Technology

## Expert Talk

Prof Praveen Kumar T N, Associate Professor, Department of Mechanical Engineering and Chief Coordinator Intellectual Property (IP) Cell participated in the Brainstorming Session on The IPR Training Programs as a resource person (Key Expert) on 10th March 2025 at Indian Institute of Science(IISc.), Bengaluru organized by Karnataka State Council for Science and Technology (KSCST) and Dept. of Collegiate and Technical Education (DCTE), Govt. of Karnataka in association with IPTel, Indian Institute of Science (IISc) and Bengaluru Science and Technology (BeST) Cluster.

Prof K. Chandra Sekhara Reddy, Assistant Professor, Dept of Mechanical Engineering organized an alumni talk by Mr Mohammed Yousuff Sohaib (1BY12 alumus) titled "Industry perspectives of operational excellence" for 4th semester ME students on 29th April 2025.



Alumni talk



## Department Activity

Team Motor Heads- Faculty coordinator, Dr Naga Madhu and student of IV and VI semester participated in Indian Karting Race on 17<sup>th</sup> March 2025 and has received the "Design Award" at the Electric Vehicle Kart Championship 2025, Travel for Eco Racing at Hindustan College of Engineering Coimbatore. And won the first prize in Anveshana 2025



The Department of Mechanical Engineering organized IDEATHON 2025 on Sustainable Development Goals (SDGs) on Thursday, 27 March 2025. The event was coordinated by Dr. O. Gurusurthy, Prof. Sundaresh, and Prof. S. Nithya Poornima, and inaugurated at 9:15 AM by Dr. Madhu M C, HOD. A total of 24 teams (4 students each) from the II, IV, and VI semesters participated. A preliminary review was held from 9:30 AM to 12:30 PM, after which nine best ideas were shortlisted for the final round. The final presentations were evaluated by Dr. G. L. Anantha Krishna (Internal Expert) and Mr. Jayachandra Reddy (External Expert) from 2:30 PM to 5:00 PM. Finally, the top three ideas were selected for prize awards.



IDEATHON 2025



Dr Jagadeesh, has been invited for the Engineering Fair held at Visvesvaraya Industrial & Technological Museum, Ministry of culture, Government of India Bengaluru, on Date: 19.03.2025 , as a Member for the Expert Committee (Judge) to evaluate the projects. This is a national level projects exhibition. Students from Engineering colleges, Diploma, ITI and NTTF have showcased their projects. Visvesvaraya Industrial and Technological Museum, Bangalore (VITM), a constituent unit of National Council of Science Museums (NCSM), Ministry of Culture, Government of India, was established in memory of Bharat Ratna Sir M. Visvesvaraya

Dr. Jagadeesh was invited as a Member of the Expert Committee (Judge) for the Engineering Fair held on 19 March 2025 at the Visvesvaraya Industrial & Technological Museum (VITM), Bengaluru, under the Ministry of Culture, Government of India. This national-level exhibition featured projects from Engineering, Diploma, ITI, and NTTF students. VITM, established in memory of Bharat Ratna Sir M. Visvesvaraya, is a constituent unit of the National Council of Science Museums (NCSM).

Prof. S. Nithya Poornima organized an industrial visit to VITM Bengaluru on 22 April 2025, where 2nd-semester CSE students explored simple machines and prime movers to enhance their understanding of basic mechanical engineering concepts.



Dr.O.Gurumurthy, Assistant Professor, participated a One-Day Workshop for Mentors of BIS Student chapters organised by the Bureau of Indian Standards (BIS) at National Institute of Training for Standardization (NITS), Noida On 30<sup>th</sup> July 2025. The workshop aims to bring together the mentors and share insights about the functioning BIS-Student Chapters and critical role of faculty Mentors in guiding and inspiring students to engage with the “World of Standards”





Workshop for Mentors of BIS student Chapters of MoU Partner Institutes was conducted at NITS, Noida (U.P)

The Aero Club of BMSIT&M hosted MACHQUEST 2025, an aviation and drone-based competition featuring an aerospace quiz, strategy round, and hands-on drone assembly. The event was inaugurated by Prof. Madhu, HOD–Mechanical Engineering, who appreciated the club’s efforts in promoting practical learning. Students from multiple departments participated, and the ETE–ME 4th semester team secured the third place.



MACHQUEST 2025

The Department of Mechanical Engineering organized an expert lecture on 29 May 2025 by Mr. Jayachandra P., Senior Manager, Tenneco Bengaluru, on *Design and Development of Pistons and Piston Rings*. The session provided students with key insights into engine components, their performance roles, material selection, and design considerations for efficiency and sustainability.





Expert lecture by **Mr. Jayachandra**

The sixth-semester students participated in the **Solar Decathlon India** competition and secured the **runners-up position**, showcasing their innovation and commitment to sustainable design. The students were Mayur B. Kudagi and Deepak Umesh Patgar of VI semester won the Best Concept Design Award at the India Design Week 2025, a national-level event held at Sri Sairam Institutions, Chennai on 24–25 April 2025



Best Concept Design Award



## Student Publication:

Kishan. B. S, "AI-Powered Cloud Computing for Performance Optimization and Scalability in Distributed Systems," *2025 International Conference on Computing for Sustainability and Intelligent Future (COMP-SIF)*, Bangalore, India, 2025, pp. 1-6, doi: 10.1109/COMP-SIF65618.2025.10969950.

Kishan. B. S, "Exploring Few-Shot Learning to Enhance NLP's Cross-Domain Capabilities," *2025 International Conference on Computing for Sustainability and Intelligent Future (COMP-SIF)*, Bangalore, India, 2025, pp. 1-6, doi: 10.1109/COMP-SIF65618.2025.10969937



## Students Articles

### AI/ML in Mechanical Systems and Maintenance



Artificial Intelligence (AI) and Machine Learning (ML) are transforming modern mechanical engineering by improving system performance, reliability, and maintenance efficiency. Traditionally, mechanical systems relied on scheduled maintenance and manual monitoring, which often led to unexpected breakdowns, unnecessary servicing, and higher operational costs.

AI and ML models analyze large volumes of data collected from sensors, machines, and equipment. These technologies help engineers understand machine behaviour, detect early signs of failure, and optimize system performance. One of the most impactful applications is **predictive maintenance**, where AI algorithms monitor vibration, temperature, pressure, and sound patterns to detect abnormalities. Instead of replacing parts on a fixed schedule, maintenance is performed only when the system shows warning signs. This reduces downtime, extends machine life, and significantly cuts maintenance costs. In mechanical systems such as turbines, compressors, HVAC units, automotive engines, and industrial robots, ML algorithms can learn patterns and identify deviations that human operators might miss.

Another important application is **process optimization**. AI helps improve manufacturing processes by adjusting parameters like tool speed, feed rate, and temperature for better efficiency. ML models can also simulate and predict mechanical performance, reducing the need for repeated physical testing. This speeds up product development and enhances design accuracy.

AI also plays a major role in **quality control**. Using computer vision, can increases consistency and reduces the chances of human error. Despite its advantages, integrating AI/ML into mechanical systems requires high-quality data, skilled personnel, and cybersecurity measures. However, the long-term benefits—improved safety, reduced costs, and higher productivity make AI a vital part of the future of mechanical engineering.

In conclusion, AI and ML are reshaping mechanical systems and maintenance by enabling predictive capabilities, enhancing performance, and supporting smarter decision-making. As industries continue to adopt digital technologies, AI-driven mechanical systems will become the new standard in ensuring efficiency, reliability, and innovation.

Prathijna T

1BY23ME42



## Mechanical Engineering in Space Exploration – Beyond Earth Applications



If mechanical engineering was not present, space exploration would ultimately remain an unapproachable dream. It is the engineers that bring the human aspiration to the forefront through the massive rocket engines as well as through the gentle devices of Mars rovers.

### Engineering the Impossible

The truth is that every spacecraft is a gem of artistic and exacting work. The mechanical engineers are the ones who produce the propulsion systems, satellite structures, robotic arms, and thermal control systems that allow the missions into space. The very process of the engineers is such that the spacecrafts can live through all the vacuum, radiation, and temperature extinctions of space, which are way harsher than anything experienced on planet Earth.

### Challenges Beyond Earth

The area of space is full of unique mechanical challenges. In zero gravity, lubricants do not act the usual way, and heat cannot be dispersed in the way it is usually done through convection and materials are subjected to many cycles of freezing and heating. To overcome these problems, the engineers come up with new ways of using lighter metals, new composite materials, and lubrication-free machine designs that can cope with such extreme conditions. Precision in these situations is of utmost importance as even the most minor defect can lead to the extinction of the mission once the spacecraft is launched.

### Innovation in Design and Manufacturing

The application of modern methods like Computer-Aided Design (CAD), Finite Element Analysis (FEA), and 3D printing has changed the way space components are produced. For example, NASA nowadays does not only print rocket engine parts but also 3D engine parts, slashing the weight and cost while increasing reliability and so on. All these developments give the engineers the chance to test, optimize, and perfect complex designs before the designs are sent outside Earth's atmosphere.

### Robotics and Automation

The capability of mechanical engineers is crucial in the area of space robotics as it is the case with the Mars rover that has a suspension system allowing it to travel on rocky terrain with ease. Robotic arms, for instance, are located on the International Space Station performing repairs and conducting



experiments — all meticulously designed for microgravity conditions with accuracy and longevity in mind.

## The Road Ahead

With space agencies and private sectors planning their future missions to the Moon and Mars, mechanical engineers are already at the forefront working on the designs of habitats, autonomous robots for construction, and systems for life-support that are eco-friendly. Their creative ideas will be instrumental in deciding the next phase of living and exploring beyond Earth.

## Conclusion

Mechanical engineering is still the primary driving force behind space exploration. The engineers are not only creating the machines but also the future of humanity among the stars by combining imagination and scientific accuracy.

Kushal Raj N

1BY23ME030



## Additive Manufacturing in Aerospace – Shaping the Future of Flight



The aerospace sector has consistently been at the forefront of technology, and currently, the Additive Manufacturing (AM)—commonly referred to as 3D printing—has completely changed the aircraft and spacecraft design, manufacturing, and maintenance process. It is a very dynamic manufacturing process that redefines the mechanical design possibilities.

### The New Age of Design Freedom

The traditional manufacturing methods usually restrict the engineers' creativity to what can be machined or cast. Additive manufacturing provides great design freedom since it enables the building of components layer by layer. Aerospace engineers can create complex shapes that would reduce both material waste and overall weight, thus they can make designs such as lightweight lattice structures, integrated assemblies, and optimized fuel channels which are all very important for the efficiency of the flight.

### Lightweighting and Performance

In aerospace, weight matters the most. Every gram saved means better fuel economy and lower emissions. With the use of titanium alloys, Inconel, and high-strength polymers, 3D printing can produce parts that are not only lighter but also stronger. For instance, GE Aviation's 3D-printed fuel nozzle for the LEAP engine, which combines 20 separate components, has a 25% lighter weight and increased durability.

### Speed, Flexibility, and Sustainability

Additive Manufacturing (AM) eliminates production timelines by not using tooling or molds, consequently changing the design cycles enormously. The whole process is very quick and consumes less time when the engineers work with digital CAD models rather than going through a series of trials from modelling to cutting a component to be operational. Besides, it is a more environmentally friendly way of doing things because it only consumes the exact amount of the material that has been required and it can even be producing spare parts on demand which storage and logistics costs get then minimized—these are all critical to aircraft maintenance in hard-to-reach areas or during space exploratory missions.

### Challenges and Future Outlook



On the one hand, AM offers a lot but, on the other hand, it has to deal with challenges like quality assurance, surface finish, and build sizes that are limited. On the other hand, the advances in metal 3D printing, process monitoring, and hybrid manufacturing are quickly conquering these challenges. It is even being suggested that, at least for some future aerospace systems, in-orbit manufacturing will be available. This means that Satellites and components will be printed in space itself cutting down the cost of carrying it up by launching.

## Conclusion

Indeed, Additive Manufacturing is not only a new tool but also a great revolution in aerospace engineering. It takes time and effort for the designers to come up with new designs and then remove the original, old type, heavy, and large ones. As the space sector keeps evolving, flight printing will always be the driving force behind the next generation of flight.

Kushal Raj N

1BY23ME030



## Mechanical Engineering in Biomedical



Mechanical Engineering in Biomedical Mechanical engineering plays a key role in the biomedical field. It combines mechanics, materials science, and design to improve healthcare diagnostics, treatments, and patient outcomes.

### Core Areas of Application

Mechanical engineering is crucial in designing and developing medical devices and equipment, such as MRI machines, ventilators, and patient monitoring systems. Engineers create prosthetic limbs and joint replacements, which help improve mobility and quality of life for patients with disabilities or injuries. Surgical robotics and minimally invasive tools designed by mechanical engineers offer greater precision and shorter recovery times during operations.

Biomechanical engineering, a subfield, looks at how physical forces affect biological tissues. This knowledge helps in developing artificial organs, implantable devices, and rehabilitation systems that work well with the human body. Computational modeling, like finite element analysis (FEA), simulates how tissues and devices behave. This optimizes performance and safety before clinical use.

### Innovation in Diagnostics and Imaging

Mechanical engineers improve biomedical imaging technologies. This leads to better diagnosis and monitoring of diseases. Innovations in medical imaging rely on good mechanical design for accuracy and usability. Signal processing and fluid dynamics help create non-invasive diagnostic tools that assist in monitoring patient health with devices like ECG monitors and biosensors.

Harshith V

1BY23ME025



## Rehabilitation and Assistive Technologies



Mechanical engineering is vital in creating assistive devices, such as exoskeletons and orthotics, which support rehabilitation and increase patient mobility. These devices use modern mechanics and sensor technologies to help patients regain functions lost due to injury, stroke, or neurological disorders.

### Advanced Manufacturing and Materials

Recent advancements include integrating 3D printing and additive manufacturing. This allows for making patient-specific implants, prostheses, and tissue scaffolds. Choosing and developing biocompatible materials is essential for successful implants and medical devices. Mechanical engineers specialize in these areas.

### Future Trends and Interdisciplinary Collaboration

Looking ahead, mechanical engineering will continue to support personalized medicine, robotics-assisted surgery, and smart wearables for real-time health tracking. Developments in nanotechnology and smart biosensors promise more targeted treatments and better disease management.

Collaboration among mechanical engineers, medical practitioners, biologists, and computer scientists is crucial for creating new solutions to complex healthcare problems. Mechanical engineering not only connects technology and medicine but also plays a vital role in shaping the future of healthcare. It improves safety, efficiency, and overall quality of medical care.

Through innovations in medical devices, diagnostics, rehabilitation systems, and interdisciplinary research, mechanical engineering continues to expand the possibilities of biomedical science for better and more accessible healthcare.

Harshith V

1BY23ME025



## OUR SISTER INSTITUTIONS

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