ROBOSTAG

e-The News Bulletin

Sakeshwar Gramin Vikas Seva Sanstha's

Adsul's Technical Campus,

Ahmednagar

Department of Mechanical Engineering

Shri Aniruddha Adsul

Chairman

Dr. P.M .Patil

Principal

Mr. Jaware A. R.

Head of Department

Vision of Institute

To be a most preferred Rural Technical Campus in the region by creating competent multifaceted Engineers and Professionals ready to serve the industry and society at large.

Mission of Institute

To establish state-of-the-art facilities and create a conducive environment for transforming the rural minds into competent, skilled, professional, researchers, technically sound, innovative aptitude, and ethics through value-based education to develop the nation for global competitiveness.

Objectives of Institute

- To provide quality education with futuristic trends in engineering and technology
- To ensure continual improvement in quality management system
- To impart innovative teaching and learning

Vision of Department

To be a premier department in Mechanical engineering to serve the need of industry and society

Mission of Department

M1: To provide state-of-the-art facilities to impart quality education.

M2: To undertake various value-added and add-on courses to make students technically sound and thorough professionals.

M3: To collaborate with the industries and strive to instil the research and problem-solving attitude amongst students and faculty.

M4: To inculcate high moral, ethical values, and spirit of national pride amongst students and faculty.

Silent feature of Department

- **Supportive learning for placement:** Placement learning is immersive and iterative. Support in the form of formative tasks and activities are crucial for student success, whilst being mindful of the need to ensure parity of student workload between modules of the same credit weighting. Placement assistance can offer students professional guidance and support to help them build successful careers. Students who might feel overburdened by the job search process might greatly benefit from placement assistance services.
- **Value added courses:** Value Added courses are career and market oriented, skill-enhancing courses that empower the students beyond their domain of study. The certificate programmers enable them to enrich their capability and enhance their employability. Value added courses are conducted for one week during the semester breaks by department faculty and external trainers.
- **Career oriented Add-On Courses:** Job-oriented courses are training and academic courses that prepare professionals for a particular career field or role. A traditional academic course may provide an overview of a certain topic or area, but a job-oriented course focuses on the knowledge and skills required for a particular job.
- **Teacher as Mentor:** The role of the Mentor Teacher is a complex blend of modeling, coaching, instructing, collaborating, and encouraging as candidates build competency in program standards. Mentor Teachers are expected to support candidates in developing the skills and knowledge to meet these standards.
- **Report writing and Paper Presentation:** A report is a specific form of writing, written concisely and clearly and typically organized around identifying and examining issues, events, or findings from a research investigation. Reports often involve investigating and analyzing a problem and coming up with a solution.
- **Professional Development for Industrial Engagement:** There are three types of employee engagement: **cognitive**, **emotional**, and **physical**. When employees are cognitively engaged, they're committed to their job, when they're physically engaged, they're invested in their work, and when they're emotionally engaged, they have an emotional connection to their work.
- **Personality Development and Soft Skill Training:** Personality Development teaches us how to communicate and display ourselves as having caring skills. It also emphasizes personal management, grooming, health, and nutrition, as well as soft skills. This course educates students on the numerous aspects of self-development. Soft skills comprise pleasant and appealing personality traits as self-confidence, positive attitude, emotional intelligence, social grace, flexibility, friendliness and effective communication skills.

Program Educational Objectives (PEOs)

PEO1: To prepare Mechanical engineering graduate with standing knowledge of Mathematics, Science, Engineering, Technology, Management, Humanities and various other interdisciplinary subjects for successful career.

PEO2: To equip students with modern tools, technology and advance soft wares for deliberating Engineering solutions.

PEO3: To equip students with broad based knowledge to support the service industry, economic development and to address social and engineering challenges of nation.

PEO4: To inculcate student with leadership skill with high level of integrity and ethical value for team building and team work.

Program Outcomes (POs)

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

PO-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.

PO-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.

PO-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.

PO-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.

PO-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.

PO-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.

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

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

PO-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.

PO-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.

PO-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.

Program Specific Outcomes (PSOs)

PSO1: An ability to design solution for thermal, hydraulic systems, design components and production processes that meet the specified needs with team work and management skill for safety, societal and environmental aspects through lifelong learning..

PSO2: An ability to use modeling and analysis software such as NX, Creo, CATIA, Ansys etc. technologies forobtaining quick, economical ad accurate solution of engineering problems.

PSO3: An ability to design electromechanical and automation systems in multidisciplinary environments through better communication.

Group Discussion

MESA Organized a Group Discussion Competition on 12/8/2022 for the students of SE, TE, and BE. The activity aimed to blend fun with learning, allowing participants to showcase their knowledge about Electrical Vehicle

The competition began with a welcome address from the MESA president, who emphasized the importance of group discussions in developing interpersonal skills, critical thinking, and teamwork. The president encouraged all participants to approach the discussion with an open mind and respect for differing viewpoints. The participants were divided into small groups, and each group was given a thought-provoking topic to discuss. Topics were selected to encourage diverse opinions and foster deeper insights.

Each group was given 15-20 minutes to discuss the topic, with a moderator overseeing the process to ensure that all participants had an equal opportunity to speak. The focus was on encouraging everyone to share their views, listen actively, and build upon each other's ideas to come up with a well-rounded perspective

The Judge For Competition was Dr.D.U.Adokar (HOD ETC Engg.,ATC,CHAS) and the winner of Group Discussion were First Chakhale Rupali Ramdas , Second Nikam Sachin Vitthal And third winner was Fand Shashikant Shivaji .

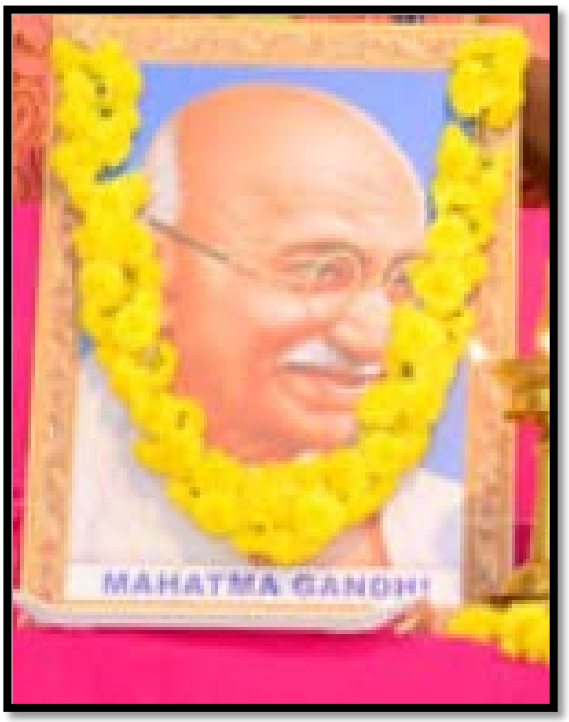
Engineer's Day

Engineer's Day, celebrated on September 15th 2022 , honors the birth anniversary of **M. Visvesvaraya**, one of India's greatest engineers and statesmen. M. Visvesvaraya's contributions to the development of engineering, infrastructure, and nation-building have left a lasting impact on the country. To commemorate his legacy, the **Mechanical Engineering Students' Association (MESA)** celebrate Engineer's Day, inspiring students to embrace engineering as a tool for progress and innovation.

The MESA president, who spoke about the significance of Engineer's Day and its relevance in today's technological world. The president highlighted M. Visvesvaraya's exemplary life, achievements in engineering, and his contributions to nation-building. The speech set the tone for the day, encouraging students to aspire to innovate and contribute to society through their engineering skills.

A panel discussion was organized featuring faculty members, industry professionals, and senior students. The discussion centered around the theme, **"Engineering and Innovation: The Role of Engineers in Shaping a Sustainable Future."** Panelists discussed the current trends in engineering, such as automation, robotics, and renewable energy, and how young engineers can contribute to solving the world's most pressing challenges. The discussion encouraged students to think critically about the future of engineering and their role in driving innovation.

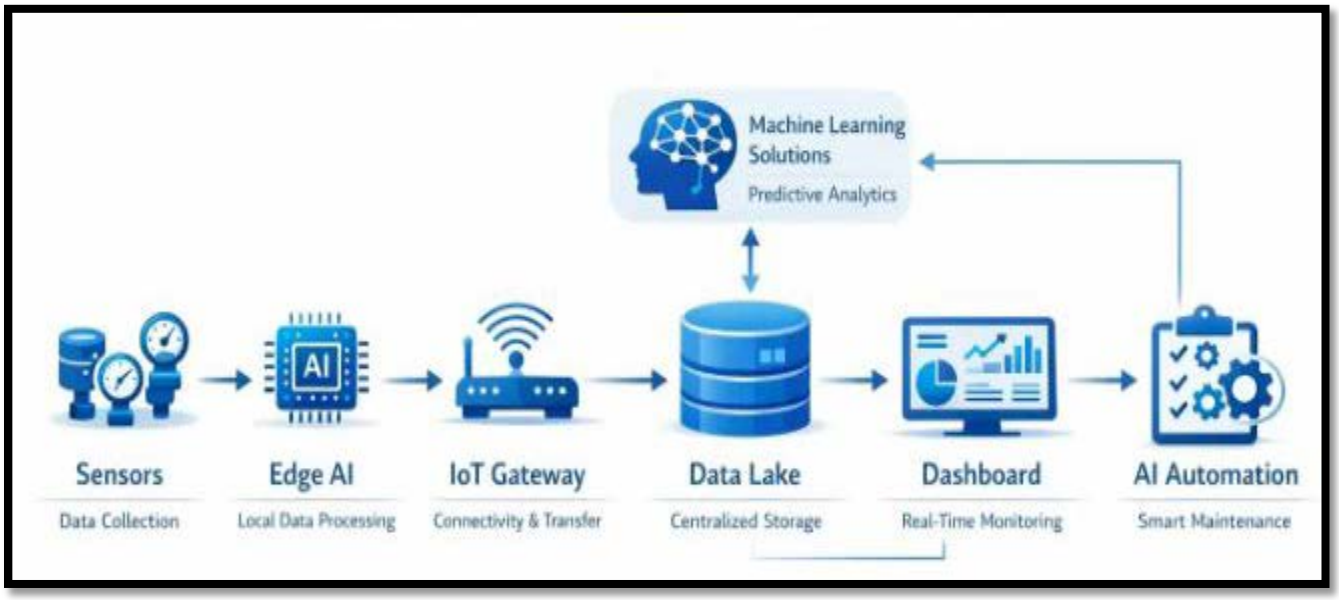
Mahatma Gandhi Jayanti



Mechanical Department celebrated Mahatma Gandhi Jayanti on 2 Oct 2022 at Adsul Technical Campus.Gandhi Jayanti is a national festival celebrated in India to mark the birth anniversary of Mohandas Karamchand Gandhi born 2 October 1869. He is famously known as Mahatma Gandhi. Mahatma means “Great Soul”. He is also known in India as the “Father of the Nation”. The day of Gandhi Jayanti is dedicated as a tribute to Mahatma Gandhi. He was a great leader of the Indian Independence Movement. He launched the famous “Quit India Movement” to drive the British out of our country. Mahatma Gandhi followed the principles of Non-violence and peace through his life. This day is also observed as International Day on Non-violence. Mahatma Gandhi was a simple, but a determined person. He had mass following. On the occasion of Gandhi Jayanti, we all thank this great saint for securing freedom for our country.

Student Article

AI-Based Predictive Maintenance of Machines



Traditional maintenance strategies are usually divided into corrective maintenance and preventive maintenance. Corrective maintenance repairs a machine after failure, while preventive maintenance replaces or services components at scheduled intervals. Predictive maintenance attempts to identify developing faults from actual machine-condition data. Mechanical equipment produces useful signals during operation. Bearings, gears, pumps, compressors and rotating shafts generate characteristic vibration patterns. Temperature, acoustic emission, oil condition, motor current and pressure can also provide information about equipment health. Sensors collect these signals and data-analysis algorithms identify abnormal behaviour.

Artificial intelligence and machine learning can support this process. A model can be trained using historical data containing normal and faulty operating conditions. When new measurements arrive, the system estimates whether the machine is operating normally or whether a fault is developing. Typical targets include bearing defects, gear wear, imbalance, misalignment and overheating. The engineering value of predictive maintenance is not simply the use of AI. The quality of the physical measurements and the understanding of failure mechanisms remain essential. For example, an increase in vibration may result from imbalance, looseness, resonance or bearing damage. An algorithm can identify a pattern, but mechanical engineers must interpret the result and decide what inspection or corrective action is appropriate.

A practical predictive-maintenance system therefore combines sensors, signal processing, mechanical knowledge and data analytics. Challenges include limited fault data, changing operating conditions, sensor failures and false alarms. Models trained on one machine may not perform well on another machine with different loads or mounting conditions.

Predictive maintenance is becoming increasingly important because modern manufacturing systems require high availability and low downtime. For mechanical engineering students, it offers an interdisciplinary application of vibration, machine design, instrumentation, statistics and artificial intelligence. The future maintenance engineer will increasingly work with both physical machines and the data generated by those machines.

- Ransing Shubham

Student Article

Collaborative Robots in Modern Manufacturing

Industrial robots have traditionally operated in separated workspaces because their speed and force can create safety risks for people nearby. Collaborative robots, or cobots, are designed to work more closely with human operators using force sensing, speed monitoring and safety-oriented control strategies. A typical collaborative application may involve a worker loading components while the robot performs repetitive fastening, inspection, dispensing or material-handling operations. The human contributes judgment and flexibility, while the robot provides repeatability and endurance. This combination is particularly useful for small-batch production where fully automated lines may not be economically attractive.

Mechanical engineering plays a major role in cobot development. Engineers design links, joints, end-effectors, protective structures and mechanisms while considering stiffness, payload, reach and dynamic response. The robot must be capable of moving accurately while limiting unwanted forces during human interaction. End-effectors are especially important. A gripper must hold a component securely without damaging it. Vacuum grippers, magnetic grippers and adaptive fingers can be selected according to material and geometry. Tool-changing systems allow one robot to perform multiple operations.

Cobots can also support quality inspection. Cameras, force sensors and other measurement devices can be integrated with the robot so that parts are inspected during production. This reduces handling and can create a more traceable manufacturing process.

However, collaborative operation does not mean that every robot application is automatically safe. A risk assessment is required for the actual robot, tool, workpiece, speed, environment and task. Mechanical hazards, sharp edges, crushing points and unexpected movements must be controlled.

The growing use of cobots illustrates how mechanical engineering is becoming increasingly interdisciplinary. Modern machine designers need knowledge of mechanisms, materials, sensors, actuators, control and human-machine interaction. The objective is not to replace every human task, but to design production systems in which automation and human skills complement each other.

- **Padir Akshay**

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