



**Saturday, March 21, 2025**  
**Volume 1 Issue 1**



## Our Department's Growth & Success in 2024-25

As we enter the new year, we are thrilled to announce that our department has experienced significant growth and success in 2024-25.

Our hardworking team has successfully implemented new strategies and projects, resulting in an increase in Students confidence & performance

## Teasers

Faculty Development Program  
: One Week Online State Level  
FDP on "Outcome Based  
Education"

42 Students got placed in MNC  
companies like John Deere,  
Eaton, Epitom Etc



**Project competition winner at  
Adsul Polytechnic**

# SANJIVANI PRATISHTHAN INSTITUTE OF TECHNOLOGY

## DEPARTMENT OF MECHANICAL ENGINEERING

### Our Vision

Become a center of excellence in Mechanical Engineering, producing innovation and creative mechanical engineers to meet the global challenges

### Our Mission

Provide a platform to the students towards attaining quality education in Mechanical Engineering

### PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

**PEO1:** To engage in Design of Systems, tools and applications in the field of Mechanical Engineering and allied engineering Industries.

**PEO2:** To apply the knowledge of Mechanical engineering to solve problems of social relevance and/or pursue higher education

**PEO3:** To work effectively as individuals and as team members in multidisciplinary projects by exhibit leadership capability, triggering social and economical commitment and inculcate community services and protect environment.

### PROGRAM SPECIFIC OUTCOMES (PSOS)

**PSO1:** Apply principles of engineering and laboratory skills for building, measurement, operation and Maintenance of Mechanical systems, such as machines.

**PSO2:** Model and analyze, design and realize Mechanical systems, components or processes related to Mechanical engineering systems.



### Message from Principal

Dear Students, Faculty, and Readers,  
It is with great pride and enthusiasm that I introduce MECHPULSE, the official technical magazine of the Mechanical Engineering Department, S. P. I. T. Polytechnic. This magazine is a testament to the department's commitment to technical excellence, innovation, and continuous learning in the ever-evolving field of mechanical engineering. This edition highlights cutting-edge research, student projects, faculty contributions, and industry insights, offering valuable perspectives on the future of engineering.

My sincere appreciation to the Mechanical Engineering Department, faculty, and editorial team for their dedication

in bringing this initiative to life. I look forward to seeing MECHPULSE grow as a beacon of knowledge and inspiration for the entire engineering community.

Best Wishes,

**Prof. Mr. Sunildatta Deoram Kapse**  
Principal



**Dr. Mr. Vijay Jadhav**  
HOD, Mechanical Engineering  
S. P. I. T. Polytechnic, Kurund

## Message from Head of Department

Dear Students, Faculty, and Readers,

It gives me immense pleasure to present MECHPULSE, the official technical magazine of the Mechanical Engineering Department, S. P. I. T. Polytechnic. Mechanical engineering has always been the backbone of technological progress, shaping the world through innovation, design, and manufacturing excellence. In this rapidly evolving era of Industry 4.0, automation, and sustainable engineering, staying informed and adaptable is key to success. Through MECHPULSE, we strive to cultivate curiosity, encourage research, and celebrate the accomplishments of our students and faculty. I encourage all students to actively participate, contribute, and make the most of this knowledge-sharing platform.

A heartfelt appreciation to the editorial team, faculty, and students who have worked tirelessly to bring this magazine to life. May MECHPULSE continue to ignite passion, innovation, and excellence in our mechanical engineers.

## Editor's Note

Dear Readers,

It is with great enthusiasm that we present to you the latest edition of MECHPULSE, the official technical Magazine of the Mechanical Engineering Department, S. P. I. T. Polytechnic. This Magazine is a platform to showcase the latest advancements, student innovations, faculty research, and industry trends that shape the world of mechanical engineering.

In this issue, we explore cutting-edge technologies such as Industry 4.0, Impact of AI on Manufacturing. We also highlight remarkable student projects and achievements, that inspire us all to push the boundaries of engineering excellence.

As the world rapidly evolves with new challenges and innovations, we encourage our students to embrace continuous learning, creativity, and hands-on experience to stay ahead in this dynamic field. We hope this newsletter serves as a source of knowledge and motivation for all budding engineers.

A special thanks to our dedicated faculty, student contributors, and editorial team for their efforts in making this edition a success. We welcome your feedback, suggestions, and contributions for future editions.

Happy Reading & Keep Innovating!

## Editor's of MECHPULSE



**Mr. Vikrant Avinash Mallav**  
Training & Placement Officer



**Mr. Raj Goraksh Gadekar**  
Third Year Student



# Emerging Mechanical Engineering Trends



## Industry 4.0

Industry 4.0 is the digital transformation of manufacturing, and smart manufacturing is a subset of it. Both are focused on using technology to improve manufacturing.

### How does Industry 4.0 work?

- **Digital twins:** Virtual models that simulate physical entities, such as factories, supply chains, or production lines
- **Cloud computing:** Delivers computing services and storage over the internet, allowing for real-time data analysis
- **Robotics:** Uses robots to perform tasks such as manufacturing
- **Machine learning:** Uses algorithms to learn from data and improve processes

### Benefits of Industry 4.0

- **Real-time decision making:** Improves productivity, flexibility, and agility
- **Improved operational efficiency:** Reduces decision-making time and improves efficiency

- **Better products:** Allows for more accurate predictions and quicker detection of physical issues
  - **Enhanced customization:** Enables more customization in manuf. and supply chain operations.
- Other applications of Industry 4.0: Predictive maintenance, Smart wearable devices, Logistics and package management, 3D printing, and Computer vision.

## IMPACT OF ARTIFICIAL INTELLIGENCE IN MECHANICAL ENGINEERING: SHAPING THE FUTURE OF INNOVATION



AI and automation are transforming mechanical design and manufacturing by enabling faster, more efficient, and innovative processes, leading to improved product quality, reduced costs, and increased productivity.

### Enhanced Design Processes:

- **Generative Design:** AI algorithms can explore numerous design options, optimizing for factors like strength, weight, and material efficiency, leading to faster and more innovative designs.
- **Simulation and Analysis:** AI-powered simulations can predict performance, identify potential issues early, and optimize designs for manufacturability.
- **Automated Prototyping:** AI can automate parts of the design process, reducing the need for physical prototypes and speeding up development.
- **Data-Driven Decision Making:** AI algorithms can analyze vast datasets to provide insights for informed decision-making, leading to better design choices.

### Benefits of AI and Automation:

- Faster Time-to-Market
- Cost Savings
- Improved Product Quality
- Enhanced Creativity and Innovation
- Increased Productivity

### Optimized Manufacturing Processes:

- Predictive Maintenance
- Real-Time Monitoring and Control
- Smart Manufacturing
- Quality Control
- Hyperautomation

# Mechanical Department Updates

## MOU SIGNING CEREMONY

We are delighted to announce the successful Memorandum of Understanding (MoU) signing between Eagle Byte Solutions and S. P. I. T. Polytechnic. This collaboration marks a significant step toward bridging the gap between academia and industry, providing students with valuable exposure to cutting-edge technologies and real-world applications.



## HEARTFELT FELICITATION TO DR. VIJAY JADHAV

We take immense pride in congratulating Dr. Vijay Jadhav on being awarded the prestigious Ph.D. Doctorate Degree. This remarkable achievement is a testament to his dedication, perseverance, and contribution to the field of Mechanical Engineering. On this special occasion, Smt. Geetanjali Shelke, Director of S.P.I.T. Polytechnic, honored Dr. Jadhav for his outstanding academic excellence and commitment to research.



## CONGRATULATIONS TO OUR PRIZE-WINNING INNOVATORS!

We are proud to announce that **Mr. Abhishek Gogade** and **Mr. Viraj Nimbalkar** have secured the **Third Prize** in the **Project Competition** held at Adsul Polytechnic.

Under the expert guidance of **Prof. Mr. Vikrant Mallav**, their project demonstrated **innovation, technical excellence, and problem-solving skills**, standing out among strong competition. This achievement reflects their hard work, dedication, and passion for engineering, making our department and institute proud.



## WORKSHOP ON AUTOCAD & SOLID MODELLING

The Mechanical Engineering Department of S.P.I.T. Polytechnic successfully organized a hands-on Workshop on AutoCAD & Solid Modelling (CATIA), conducted by Mr. Balasaheb. This session provided students with in-depth knowledge and practical experience in computer-aided design (CAD) and 3D modeling, essential skills for modern engineering and manufacturing industries.



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# Mechanical Department Updates



## Successful Campus Placement Drive at S.P.I.T. Polytechnic

We are thrilled to announce the successful Campus Placement Drive conducted at S.P.I.T. Polytechnic, where leading companies John Deere, Eaton, Sanjay Technoplast Pvt Ltd, Chloride Metals, and Epitome participated in recruiting our talented students.

Out of 243 candidates, an impressive 77 students secured placements across these esteemed organizations. We take immense pride in sharing that 42 of the selected students belong to the Mechanical Engineering Department, showcasing their technical excellence, problem-solving abilities, and industry-ready skills.

सनी सोनावळे : सकाळ वृत्तसेवा

### नोकरीत प्रामाणिकपणा, कष्ट केल्यास प्रगती

लहु पाटील; एसपीआयटी विद्यालयातील नोकरी मेळव्यात ५२ विद्यार्थ्यांची निवड

टाकळी ढोकेश्वर, ता. ७ :

माणसाचे यश आणि अपयश त्याच्या कृती आणि सवयीवर अवलंबून असते. नोकरीत आत्मविश्वास, हिंमत, चिकाटी बरोबर प्रामाणिकपणा, कष्ट केल्यास निश्चित प्रगती होईल, असे प्रतिपादन इटॉन कंपनीचे मानव संसाधन व्यवस्थापक (एचआर) लहु पाटील यांनी केले.

कुरुंद (ता. पारनेर) येथील संजीवनी प्रतिष्ठान संचालित एसपीआयटी विद्यालयात विविध कंपन्यांनी विद्यार्थ्यांसाठी नोकरी मेळव्याचे आयोजन केले होते. यावेळी जॉन डियर कंपनीचे एचआर अमित बोरडे, इपिटोम कंपनीचे एचआर राहुल दीक्षित, प्राचार्य सुनीलदत्त कापसे उपस्थित होते. यावेळी बोरडे यांनी विद्यार्थ्यांनी मुलाखत देताना



कुरुंद : नोकरी मेळव्यात निवड झालेल्या विद्यार्थ्यांसमवेत कंपनी अधिकारी, प्राचार्य सुनीलदत्त कापसे आदी.

कसाप्रकारे तयारी करावी याबाबत सविस्तर मार्गदर्शन केले. दीक्षित यांनी नोकरी मेळव्याचे महत्त्व व कंपनीत काम करताना घ्यावयाची दक्षता याबाबत माहिती दिली. विद्यालयाचे ट्रेनिंग व प्लेसमेंट ऑफिसर विक्रान्त मल्लाव यांनी आपल्या सर्व सहकाऱ्यांसमवेत या मेळाव्याचे नियोजन केले.

मेळाव्यात

एसपीआयटी

पॉलिटेक्निक, सोनिया गांधी पॉलिटेक्निक श्रीगोंदे, समर्थ पॉलिटेक्निक, म्हसणे फाटा, साईकृष्ण पॉलिटेक्निक, घारागाव या विद्यालयातील १३९ विद्यार्थ्यांची मुलाखत घेण्यात आली. यामधून जॉन डियर कंपनीत १५, इटॉन कंपनीत १८, क्लोराईड कंपनीत ११, एपिटोम कंपनीत आठ विद्यार्थ्यांची निवड निश्चित करण्यात आली.

## नगर सहाद्री

### एसपीआयटी पॉलिटेक्निकच्या विद्यार्थ्यांची नोकरीसाठी निवड

पारनेर । नगर सहाद्री

कुरुंद (ता.पारनेर) येथील एसपीआयटी पॉलिटेक्निक कॉलेजच्या २५ विद्यार्थ्यांची कॅम्पस इंटरव्यू मध्ये संजय टेक्नोप्लास्ट कंपनीत नोकरीसाठी निवड करण्यात आली. संजय टेक्नोप्लास्ट प्रा. लि. कंपनीचे जनरल मॅनेजर बाबासाहेब चितळे, एच. आर. नवनाथ शिंदे यांनी विद्यार्थ्यांची कॅम्पस इंटरव्यू घेतली.

तृतीय वर्षातील विद्यार्थ्यांना त्यांची उन्हाळी २०२५ ही एमएसबीटीई, मुंबई यांचेमाफत घेतली जाणारी बोर्ड परीक्षा पूर्ण झाल्यानंतर कंपनीत ऑन रोलवर नोकरीत रुजू करून घेतले जाणार आहे. कॅम्पस इंटरव्यूनंतर निवड झालेल्या विद्यार्थ्यांना कंपनीचे जनरल मॅनेजर बाबासाहेब चितळे यांनी



विद्यार्थ्यांनी अभ्यास व आपले प्रत्येक काम मनापासून केले तर यश निश्चित मिळते हे वेगवेगळी उदाहरण देवून पटवून दिले. तसेच त्यांनी कंपनीबद्दल थोडक्यात माहिती दिली. कॉलेजचे ट्रेनिंग व प्लेसमेंट ऑफिसर प्रा. विक्रान्त मल्लाव आणि मेकॅनिकल इंजिनिअरिंग विभाग प्रमुख डॉ. विजय जाधव, प्रा. भावना वाघमारे यांनी कॅम्पस इंटरव्यूचे नियोजन केले. कार्यक्रमाचे प्रास्ताविक प्रा. संदिप जाधव यांनी केली तर आभार विभागप्रमुख

प्रा. किशोरकुमार कोकणे यांनी मानले. निवड झालेल्या विद्यार्थ्यांची जी एस महानगर बँकेच्या अध्यक्षा व संजीवनी प्रतिष्ठान मुंबई या संस्थेच्या खजिनदार सुमनताई शेळके, सचिव सफराज पठाण, अहमदनगर जिल्हा बँक व जी एस महानगर बँकेच्या संचालिका गीतांजली शेळके, जी एस महानगर बँकेच्या संचालिका स्मिता शेळके, पालकवर्ग, प्राचार्य सुनीलदत्त कापसे, सर्व विभागप्रमुख, प्राध्यापक आणि कर्मचारीवृंद यांनी अभिनंदन केले.

This placement drive was a testament to the quality education, hands-on training, and professional grooming imparted at our institute. We extend our heartfelt congratulations to all the selected students and gratitude to the participating companies for providing these valuable career opportunities

Wishing all our placed students a bright and successful future in their professional journeys!

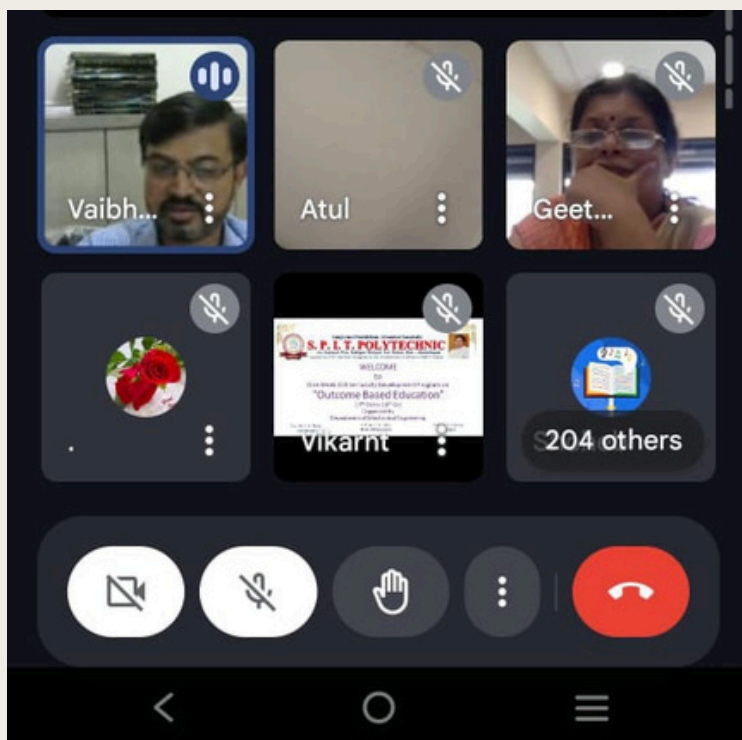


# Mechanical Department Updates

## One-Week Online Faculty Development Program on "Outcome-Based Education"

The **Mechanical Engineering Department** of S.P.I.T. Polytechnic successfully organized a **One-Week Online Faculty Development Program (FDP)** on "Outcome-Based Education" from **14th October to 18th October 2024**. The program aimed to enhance the **teaching-learning process** by focusing on **student-centric education, assessment methodologies, and curriculum development** aligned with **Outcome-Based Education (OBE) principles**.

The event witnessed an overwhelming response, with **500+ participants** actively engaging in the sessions.



The FDP featured **renowned speakers**:

🔧 **Dr. Nitin Korde** – Expert in Educational Reforms

🔧 **Dr. Anil Sahu** – Specialist in Accreditation & OBE Implementation

🔧 **Dr. Geeta Atkar** – Academic Researcher & Curriculum Developer

The **inaugural speech** was delivered by our **respected Head of Department Prof. Dr. Vijay Jadhav** and **Principal Prof. Mr. S. D. Kapse**, emphasizing the importance of OBE in modern education.

A screenshot of a presentation slide titled 'NBA Criteria Summary (Tier-I)'. It contains a table with 9 rows and 3 columns: Criteria Number, Criteria, and Marks/Weightage. The table is divided into 'Program Level Criteria' (rows 1-7) and 'Institution Level Criteria' (rows 8-9).

Criteria Number	Criteria	Marks/Weightage
<b>Program Level Criteria</b>		
1	Vision, Mission and Program Educational Objectives	50
2	Program Curriculum and Teaching –Learning Processes	100
3	Course Outcomes and Program Outcomes	175
4	Students' Performance	100
5	Faculty Information and Contributions	200
6	Facilities and Technical Support	80
7	Continuous Improvement	75
<b>Institution Level Criteria</b>		
7	First Year Academics	50
8	Student Support Systems	50
9	Governance, Institutional Support and Financial Resources	120

The **vote of thanks** was graciously delivered by **Prof. Vikrant Mallav**, acknowledging the contributions of speakers, organizers, and participants. The event was seamlessly conducted, with **Prof. Bhavna Waghmare** and **Miss Nita Salunke** expertly managing the anchoring.

The FDP provided **valuable insights, interactive discussions, and practical strategies** to improve educational outcomes. We extend our gratitude to all the speakers, faculty members, and participants for making this program a **resounding success!**

A screenshot of a presentation slide titled 'Vision and Mission Statements'. It contains a bulleted list of four points. At the bottom, there is a footer with 'Engineering', 'Management', 'Law', 'Schools', 'Other Courses' and the 'RAISONI' logo.

Vision and Mission Statements	
•	Statements help in defining aspirations and to remain focused
•	Should be written in a simple language, easy to communicate and should define objectives which present near future of the Institute
•	Vision statement is dream of where one wants the Institute to be and inspires all the stake holders
•	Mission statements are actionable statements that guide the stake holders to act

# Mechanical Department Updates

## PROJECT COMPETITION

The **Mechanical Engineering Department of S.P.I.T. Polytechnic** successfully organized a Project Competition, where students showcased their **innovative ideas, technical expertise, and problem-solving skills**. A special highlight of the event was the **interactive session with our esteemed Principal Prof. Mr. S. D. Kapse**.



## INDUSTRIAL VISIT

The **Mechanical Engineering Department of S.P.I.T. Polytechnic** organized an industrial visit to **Kanhaiya Milk Processing Unit**, providing students with a **practical understanding of industrial operations, automation, and mechanical processes** involved in the dairy industry. During the visit, students got a firsthand look at **milk pasteurization, homogenization, refrigeration systems, packaging, and quality control techniques**. Experts from the unit explained the role of **mechanical engineering in food processing, machine maintenance, and efficiency optimization**.

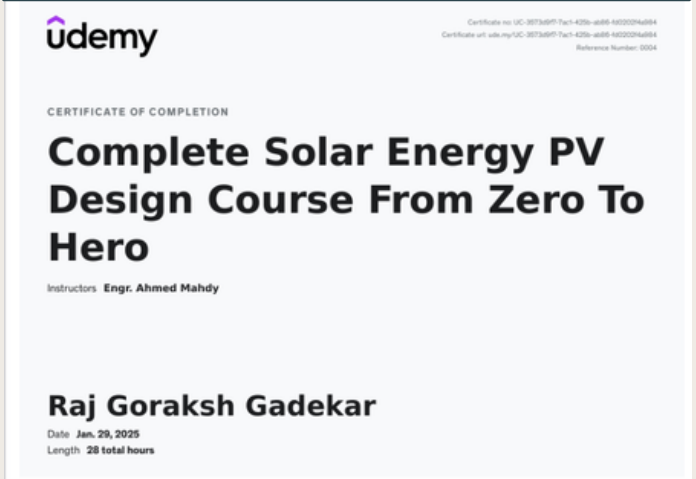
## CAREER GUIDANCE



The **Mechanical Engineering Department** successfully organized a **Career Guidance Session for 10th-grade students** at their school, aimed at helping them make informed decisions about their future careers in engineering and technology.

During the session, faculty members provided valuable insights into various **engineering disciplines, diploma courses, career opportunities, and industry demands**. Students were introduced to the scope of mechanical engineering, its role in manufacturing, automation, robotics, and sustainable development.

## MOOCS COURSE CERTIFICATION



Through platforms like NPTEL, Coursera, Udeemy, and edX, students explored courses in Automobile Engineering, CAD/CAM, 3D Printing, Industrial Automation, Quality Control, and more. These certifications demonstrate their commitment to continuous learning, self-improvement, and staying updated with the latest technological advancements.





## WORKSHOP



## Laboratories of the Mechanical Engineering Department

### Power Engineering & Thermal Lab 🔥⚙️

The **Power Engineering & Thermal Lab** is equipped with **IC engines, heat exchangers, and refrigeration systems**, enabling students to study **thermodynamic principles, heat transfer, and energy conversion**.

### Fluid Mechanics & Machinery Lab 🌊🚀

The **Fluid Mechanics & Machinery Lab** provides hands-on experience in **fluid flow dynamics, hydraulics, and mechanical pumps**. With advanced setups like **Bernoulli's theorem apparatus, turbines, and flow measuring devices**.

### Automobile Engineering Lab 🚗🔧

The **Automobile Engineering Lab** allows students to explore the **working of IC engines, vehicle transmission systems, and modern automotive technologies**. Equipped with **braking systems, and emission analysis tools**.



### Theory of Machines Lab ⚙️🔄

The **Theory of Machines Lab** focuses on **kinematics and dynamics of machines**, helping students analyze **gear trains, flywheels, cam-follower mechanisms, and gyroscopic effects**. T

### Measurement & Quality Control Lab 📏✅

Precision and accuracy are key aspects of mechanical engineering, and the **Measurement & Quality Control Lab** provides exposure to **metrology instruments like micrometers, vernier calipers, and surface roughness testers**.