



CHANDIGARH ENGINEERING COLLEGE CGC, LANDRAN, MOHALI

Building Careers. **Transforming lives.**



Mechnotimes
NEWSLETTER

**Department of Mechanical
Engineering**

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VISION OF CHANDIGARH ENGINEERING COLLEGE-CGC, LANDRAN

To become a leading institute of the country for providing quality technical education in a research-based environment for developing competent professionals and successful entrepreneurs.

MISSION OF CHANDIGARH ENGINEERING COLLEGE-CGC, LANDRAN

1. To provide state of the art infrastructure and engage proficient faculty for enhancing the teaching learning process to deliver quality education.
 2. To give a conducive environment for utilising the research abilities to attain new learning for solving industrial problems and societal issues.
 3. To collaborate with prominent industries for establishing advanced labs and using their expertise to give contemporary industry exposure to the student and faculty.
 4. To cater opportunities for global exposure through association with foreign universities.
 5. To extend choice-based career options for students in campus placements, entrepreneurship and higher studies through career development program.
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DEPARTMENT OF MECHANICAL ENGINEERING

Vision of the Department

To emerge as centre of quality education for creating competent mechanical engineers catering to the ever-changing needs of industry and society.

Mission of the Department

M1: To provide quality education by constantly updating departmental resources and using effective teaching learning methodology.

M2: To promote research practices in the field of mechanical engineering in pursuit of academic excellence and for the benefit of society.

M3: To establish industrial collaborations for imparting contemporary knowledge to keep pace with the technological challenges in the interdisciplinary and core areas of mechanical engineering.

M4: To provide opportunities to the students for global exposure through international collaborations.

M5: To nurture students through pre-placement training programs to succeed in campus placements and to provide guidance for entrepreneurship and higher studies.



EDITOR'S COLUMN

A newsletter stands as a testament to the vision and mission of a department, serving as a platform to highlight key events, innovative activities, and notable academic achievements. In the ever-evolving field of mechanical engineering, the pursuit of innovation and sustainability remains at the forefront, driving progress to shape a better world and leave a meaningful impact on society. While we honour our past accomplishments, our focus is firmly set on the future, brimming with opportunities and boundless possibilities. The discipline of mechanical engineering holds immense potential to redefine the boundaries of technology and human ingenuity. With unwavering commitment, we aim to prepare the next generation of engineers to tackle the challenges of tomorrow with competence and creativity. This newsletter not only celebrates the remarkable contributions of our students and faculty but also serves as a window into their inspiring journey of growth and discovery. As valued readers and contributors, you are integral to this transformative journey. Your engagement fuels the spirit of progress and innovation that defines our community. We take great pride in sharing these glimpses of our department's dynamic endeavours and trust that this culture of knowledge-sharing will endure, inspiring others to follow in our footsteps. Let this publication be a beacon of excellence and a testament to the unwavering commitment to advancing the field of mechanical engineering.



AISHNA MAHAJAN

EDITOR-IN-CHIEF

MECHNOTIMES

FROM EDITORIAL'S BOARD

Welcome to the latest edition of *Mechnotimes*, the official newsletter of the Mechanical Engineering Department at Chandigarh Engineering College - CGC, Landran, covering the period from October to December 2024. As we navigate the ever-expanding horizons of engineering and technology, we are reminded of the immense opportunities and responsibilities that come with this journey. This editorial highlights the critical importance of innovation and sustainability as the driving forces shaping the future of the mechanical engineering landscape. Innovation lies at the heart of engineering, acting as the catalyst for progress. From the revolutionary invention of the steam engine to the cutting-edge advancements in electric vehicles, innovation has continually transformed the way we live, work, and interact with our environment. As aspiring mechanical engineers, we stand at the forefront of this exciting evolution, constantly challenging boundaries and redefining possibilities. Through this edition of *Mechnotimes*, we celebrate the spirit of ingenuity and dedication that propels our students and faculty towards excellence, inspiring them to make meaningful contributions to the world.

ANURAAG GILHOTRA (2102424), SEM VIII

HARSHIT RANA (2422072), SEM IV



Expert Talk on "Operational Efficiency and Employability: Building a Workforce for the Future"

On January 22, 2025, Mechnorobs Club of Department of Mechanical Engineering, organized an expert talk on "Operational Efficiency and Employability: Building a Workforce for the Future." The session was conducted by Mr. Devinder Thakur, *Chief Manager at SML ISUZU LTD.*

The session focused on enhancing workplace efficiency and the key skills required to thrive in today's dynamic job market. Mr. Thakur provided valuable insights into industry expectations, workforce development, and strategies for improving operational effectiveness. He emphasized the importance of technical proficiency, problem-solving, and adaptability in securing and excelling in engineering careers. The talk helped students understand career readiness and industry trends, providing them with practical knowledge for future success.



Figure: Mr. Devinder Thakur, Chief Manager at SML ISUZU LTD, delivering an expert talk on "Operational Efficiency and Employability: Building a Workforce for the Future"

Industrial Visit to Swaraj Division Foundry, Mahindra & Mahindra

The Mechnorobs Club of the Department of Mechanical Engineering, organized an industrial visit to **Swaraj Division Foundry, Mahindra & Mahindra** on January 28, 2025. The visit provided students with first-hand exposure to modern manufacturing and casting processes used in the automotive sector.

Students observed various stages of metal casting, machining, and quality control, gaining practical insights into foundry operations. Experts at the facility explained the significance of precision engineering, material selection, and automation in enhancing production efficiency.

This visit bridged the gap between theoretical knowledge and industrial applications, equipping students with valuable industry insights and a better understanding of real-world manufacturing processes.



Figure: Group photograph of students during the industrial visit to *Swaraj Division Foundry, Mahindra & Mahindra*

Industrial Visit to Guru Gobind Singh Super Thermal Plant, Rupnagar

An industrial visit to Guru Gobind Singh Super Thermal Plant, Rupnagar, was organized by the Mechnorobs Club, Department of Mechanical Engineering, on March 18, 2025, to give students practical exposure to power generation systems and thermal plant operations.

During the visit, students explored key aspects of power production, including boiler operations, turbine functioning, and efficiency optimization. Experts at the plant explained energy generation, emission control, and the role of automation in modern power plants.

This visit enriched students' understanding of thermal energy production, bridging theoretical knowledge with real-world industrial applications and preparing them for careers in the energy sector.



Figure: Group photograph of students during the industrial visit to *Guru Gobind Singh Super Thermal Plant, Rupnagar*

Workshop on "Automotive Plastics & Creo: Design, Simulate, Innovate"

Mechnorobs Club of the Department of Mechanical Engineering, , conducted a hands-on workshop titled **"Automotive Plastics & Creo: Design, Simulate, Innovate"** on March 21, 2025. The session was conducted by Mr. Pritam Prakash, CEO of P2P Analysis and Solutions.

The workshop introduced students to the latest advancements in automotive plastics and the application of Creo software for design and simulation. Mr. Prakash provided in-depth training on material selection, component design, and virtual prototyping, helping participants develop practical skills for the automotive industry.

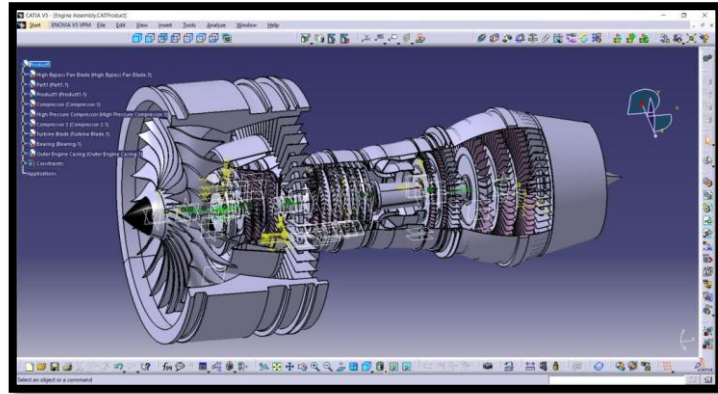
This interactive session improved students' technical skills by connecting classroom learning with real-world engineering and encouraging innovation in product development.



Figure: Students engaged in the hands-on workshop titled *"Automotive Plastics & Creo: Design, Simulate, Innovate"*

ICT Workshop: "Design Now Challenge"

The Mechnorobs Club of Department of Mechanical Engineering at Chandigarh Engineering College-CGC, Landran, organized a five-day ICT workshop, **Design Now Challenge**, from March 24 to March 28, 2025. The workshop was conducted by Mr. Ravi Sharma, Manager at ICT Academy, Autodesk, and focused on enhancing students' skills in digital design and simulation.



Participants engaged in hands-on sessions covering advanced CAD modelling, design optimization, and real-world problem-solving using Autodesk tools. The workshop encouraged creativity and innovation, equipping students with practical knowledge applicable to modern engineering challenges.



Figure: Students actively participating in the ICT workshop titled *"Design Now Challenge"*

Alumni Talk on "Market Research for Engineers: Understanding Industry Trends and Consumer Needs"

A alumni Talk on "Market Research for Engineers: Understanding Industry Trends and Consumer Needs" was organized on March 28, 2025, by the Mechnorobs Club of Department of Mechanical Engineering. The session featured **Mr. Gagandeep Sohanpal**, an alumnus (2007-2011) and currently Technical Marketing Manager at Cloud Wick Technologies.

The session focused on the importance of market research in engineering, helping students understand industry trends, consumer needs, and data-driven decision-making. Mr. Sohanpal shared insights on how engineers can leverage market analysis to develop innovative solutions and enhance product viability.

This interactive session provided students with valuable knowledge on industry research methodologies and strategic thinking, preparing them for dynamic roles in engineering and technology sectors.



Figure: Group photograph of participants with *Mr. Gagandeep Sohanpal*, distinguished alumnus of the 2007–2011 batch

4D Printing (Materials that Change Shape Over Time)

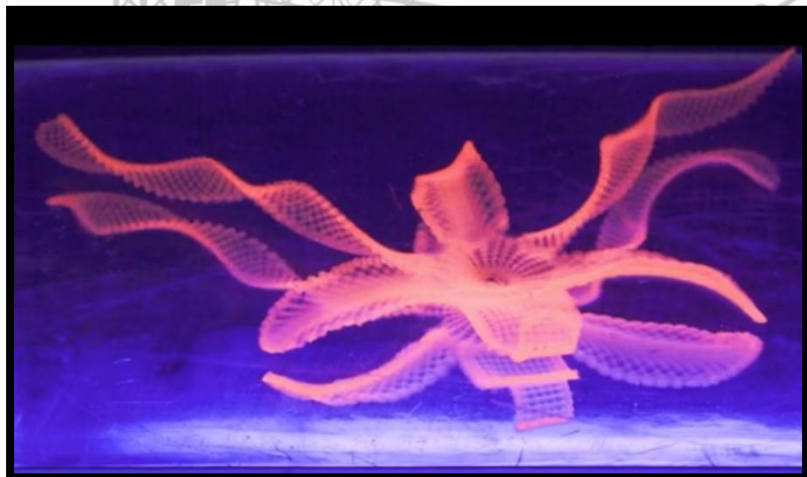
Technology is growing very fast. We have seen 3D printing, where we can make things like tools, toys, or machine parts layer by layer. But now, a new technology has come – it is called **4D Printing**. 4D Printing is like 3D printing, but with one special feature – **time**. In 4D printing, the printed object can **change its shape, size, or behaviour over time** when it is exposed to things like **heat, water, light, or air**. This means the object is smart. It can react to the environment and change on its own without any motor or battery.

To make 4D printed objects, special materials are used. These materials are called **smart materials**. Some common ones are:

- **Shape Memory Polymers (SMPs)**
- **Hydrogels**
- **Liquid Crystal Elastomers**

These materials can **bend, twist, fold, or expand** when they come in contact with water, heat, or other triggers. The design is made using a computer and printed using a 3D printer. But the magic happens later – the printed object starts changing shape when conditions around it change.

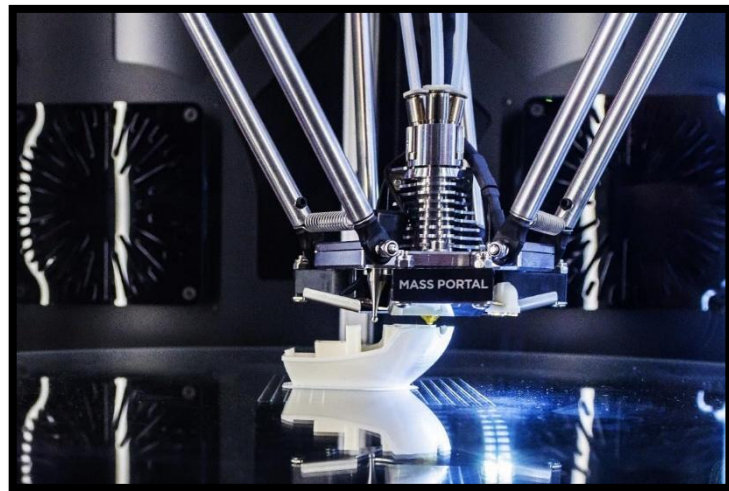
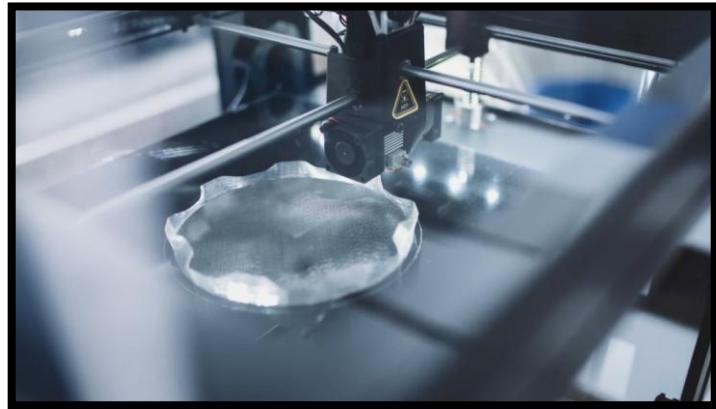
Let's understand this with a very simple example. Imagine we print a small flat flower using a smart material called **hydrogel**. When this flower is dry, it looks plain and flat. But as soon as we dip it into water, the



hydrogel absorbs the water and starts to swell. Slowly, the flower begins to change shape. The petals start bending outward, and in just a few minutes, the flat flower looks like it has bloomed naturally—just like a real flower opening in the sunlight. This whole change happens without any motor, battery, or extra help—

only because of the smart material and the environment around it. This change **over time** is what gives 4D printing its name. The "fourth dimension" is **time**—because the printed object changes its form as time passes after a trigger.

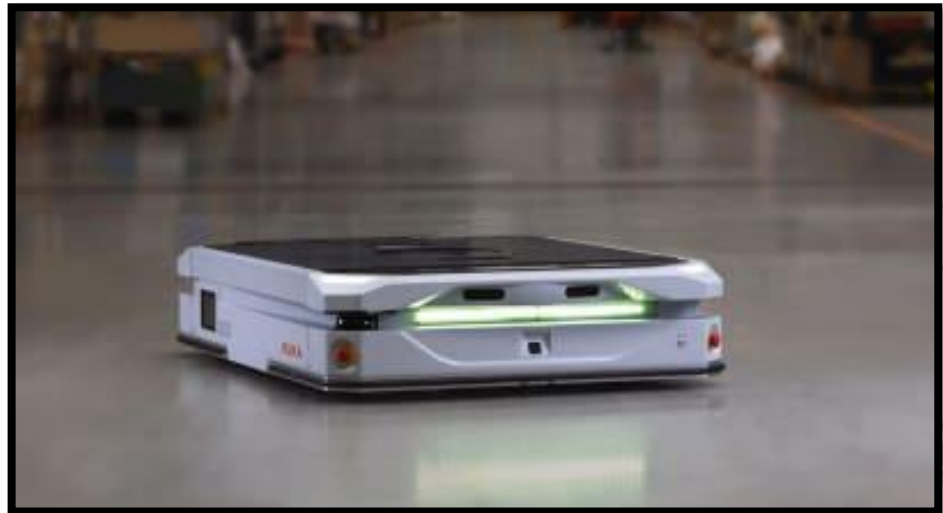
The future of 4D printing is full of exciting possibilities. In the medical field, it can be used to create devices like **stents** that expand on their own once inside the body, or **smart bandages** that tighten or loosen based on temperature. Scientists are also working on **drug delivery systems** that release medicine only at the right spot and time inside the human body. In the aerospace and defence industries, 4D printing can be used to make **airplane parts** that change shape during flight for better performance. It can also be used to create **self-healing materials** that fix small cracks or damages automatically, which is very useful for space missions or military tools. In fashion and daily life, imagine clothes that **adjust based on weather**—like a jacket that becomes lighter when it's hot and warmer when it's cold. Sportswear could become smarter, adjusting tightness according to your body movement. Even in construction, 4D printing can be used to create **self-assembling shelters** in remote or dangerous places like underwater, space, or disaster areas where human workers can't easily go. In short, 4D printing is a step forward in making machines and objects that can **think and act on their own**—responding to the environment like living things. Though it is still developing, 4D printing has the potential to completely change industries like healthcare, fashion, construction, and aerospace in the near future.



Written by: Shreya Jamwal (2337692), Sem IV

Autonomous Mobile Robots (AMRs) in Industry

In today's modern world, many factories and companies are using robots to help with work. One special type of robot used in industries is called an **Autonomous Mobile Robot**, or **AMR**. These robots are smart. They can move around by themselves without anyone controlling them with a remote or computer. They are not like old robots that only move on fixed paths. AMRs can find their own way and do different jobs all by themselves. AMRs use **sensors**, **cameras**, and **software** to see and understand the area around them. They make a map inside their brain (software) and move safely in the factory. For example, if a person or a box comes in front of them, they do not stop forever or crash. They go around the object and continue their work. This is why AMRs are very useful in places like factories and warehouses where things are always moving and changing.



Example:-

Imagine you are working in a big factory. You need to carry boxes from one side to the other. Doing this many times is hard and takes a lot of time. But if the company has AMRs, the robot will carry the boxes for you. You just tell the robot once what to do, and it will keep doing it again and again without stopping. This helps save time, and the workers can do other important jobs. AMRs are used for many jobs. They can carry heavy parts from one place to another. They can bring tools to machines. They can also move finished products to the storage area. All of this happens without anyone needing to push the robot or guide it. AMRs are also **very safe** because they know when something is in their way and they avoid it.

The parts that help the AMR do its work are:

- **Wheels** – to move around
- **Battery** – to give power to the robot
- **Sensors and Cameras** – to see and understand the surroundings
- **Software or Program** – this is like the robot's brain, which helps it take decisions

Some AMRs can also connect to the **internet**. This means the robot can talk to computers or other machines in the factory. It can receive new instructions or tell what job it has done. For example, if the robot finishes delivering a part, it can send a message to the system saying, "Task done."



In the future, AMRs will be used in more and more industries. They are very helpful in saving **time**, **energy**, and **money**. They also reduce mistakes that humans sometimes make. AMRs can work all day without getting tired. They are also useful in dangerous places where it is not safe for humans to work, like high temperatures or toxic environments.

Creation of AMR at home:

To create an Autonomous Mobile Robot (AMR) at home, you need some basic skills. First, you should learn **basic electronics** like how to connect wires, motors, and sensors. Then, learn some **programming**, especially using Arduino or Python, to control the robot's actions. You should also understand **robotic logic**, like how to make the robot avoid obstacles or follow a path. Some **mechanical skills** are also needed to build the robot's body using materials like cardboard or plastic. If you want to control the robot using your phone, learn **Bluetooth or Wi-**

Fi communication. Start small with simple projects like a line-following or obstacle-avoiding robot, and slowly build your skills step by step and then create a full prototype.

Autonomous Mobile Robots (AMRs) are very smart machines. They help factories and companies do work faster and safer. They can move on their own, avoid obstacles, and carry materials from one place to another. They use sensors, wheels, batteries, and smart software to do their job. AMRs are becoming more common in industries, and in the future, they will be a big part of how smart factories work. They are truly changing the way work happens in the industry.

Written by: Nikhil (2102436), Sem VIII

