



# MECHNOTIMES

NEWSLETTER

# VOLUME-7

# **ISSUE-IV**

APRIL-JUNE 2023

# VISION OF THE CHANDIGARH ENGINEERING COLLEGE-CGC

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 THE CHANDIGARH ENGINEERING COLLEGE-CGC

- 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 conductive environment foe 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.



### 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 mirrors a department-Its vision and mission. It also highlights events, activities and academic prowess and achievements. The journey of mechanical engineering is an ongoing quest to create a better world. By embracing innovation and sustainability, we can drive positive change and leave a lasting impact on society. As readers and contributors to this magazine, you are part of this transformative journey, and we look forward to witnessing the exciting advancements that lie ahead. We feel extremely overjoyed to share glimpses of the activities taken by our zealous students under the guidance of their faculty as their sailors during the period.



AISHNA MAHAJAN EDITOR-IN-CHIEF MECHNOTIMES

#### FROM EDITORIAL'S BOARD

Welcome to our latest edition of Mechnotimes of Mechanical Department Newsletter of Chandigarh Engineering Colleges-CGC,Landran for month APRIL-JUNE 2023. As we delve into the world of engineering and technology, we are reminded of the boundless opportunities and responsibilities that lie ahead. In this editorial, we emphasize the importance of embracing innovation and sustainability to drive progress in the mechanical world. Innovation is the beating heart of the engineering field. From the steam engine to the modern electric vehicle, innovation has shaped the way we live, work, and interact with the world. As mechanical engineers, we are at the forefront of this dynamic transformation, continuously pushing the boundaries of what's possible. The reader will definitely be able to see to paragon vision of the department. We hope that this Culture of releasing the newsletter continue forever and may become quoted example for all to follow.

ANURAAG GILHOTRA (2102424), SEM IV NAVNEET SINGH (2102436), SEM IV YUVRAJ (2003092), SEM VI

### INDUSTRIAL VISIT TO GGSTPP, ROPAR

Mechanical department CEC-CGC,Landran organized an Industrial visit to GGSTPP, Ropar (Thermal Power Plant) on 5 May 2023. Students got to see how power is generated in thermal Power Plant. Students were also educated about the working of 4.8 kWp floating type solar photo-voltaic plant, installed by the power plant management, as green energy initiative. It was a great experience to actually take a look at whatever we had studied in theory and study the coal to electricity cycle in detail.



**Guru Gobind Singh Super Thermal Power Plant** is situated near village Ghanauli on Chandigarh-Manali highway. It is about 12 km from Roopnagar and 55 km from Chandigarh. The power plant is one of the <u>coal</u> based power plants of PSPCL. The plant before 01.01.2019 has an installed capacity of 1260 MW i.e. six units of 210 MW, however wef 01.01.2018 Units 1 & 2 of GGSSTP, Rupnagar have retired, as such the present installed capacity of GGSSTP, Rupnagar is 840 MW i.e. 4 Units of 210 MW.

The plant has its source of water supply from Nangal Hydel Channel. The coal used mainly comes from mines in Bihar, West Bengal, Jharkhand, Chhattisgarh and Madhya Pradesh from more than 50 sources called collieries. It has 210 MW, 3 cylinder mixed flow tandem coupled, 3000 rpm BHEL make turbines. It has 247 MVA, 15.75 kV, 9050 A at 0.85 lag, 50 Hz, 3 phase, double star two pole generators.

### MECH FIESTA 2023

The Department of Mechanical Engineering organized MECH FIESTA 2K23 an inter department competition on 12 April 2023. MECH FIESTA 2K23 is Technical event organized by SFMT Club of ME Department. It provided an opportunity for students to develop their skills, and practice creating 3D models from 2D drawings and use welding equipment to assemble parts and compete against each other.







Sahibzada Ajit Singh Nagar, Punjab, India Block-3, Chandigarh College Of Engineering, Sector 112, Sahibzada Ajit Singh Nagar, Punjab 140307, India Lat 30.686538° Long 76.665416° 12/04/23 11:00 AM GMT +05:30



# **IS JOB IS ENOUGH FOR LIFE**

The question of whether a job is enough for life depends on individual perspectives, priorities, and values. For some people, a job may be sufficient to meet their basic needs and provide them with a sense of stability and purpose. They may find fulfillment and satisfaction in their work, and their job might be an essential component of a fulfilling life.

On the other hand, many individuals seek more than just a job to find meaning and happiness in life. They may aspire for personal growth, pursue hobbies and passions, build strong relationships, contribute to their communities, and seek a balanced and well-rounded life beyond their professional responsibilities.

Here are some factors to consider when contemplating whether a job is enough for life:

- 1. **Financial Stability**: For many people, having a job that provides financial security is a primary concern. A *steady income can support a comfortable lifestyle*, provide for basic needs, and allow for future planning.
- 2. **Career Fulfillment**: Some individuals find a sense of purpose and fulfillment in their chosen career path. Their job may align *with their interests, skills, and values, making it a significant* aspect of their overall life satisfaction.

3. Work-Life Balance: Achieving a healthy work-life balance is crucial for overall wellbeing. While a job is essential, a balanced life *includes time for relaxation, family, hobbies, and personal growth.* 

- 4. **Personal Growth and Development**: Many people seek opportunities for personal growth and learning outside of their *professional roles*. Pursuing education, hobbies, or self-improvement can enrich life beyond the boundaries of a job.
- 5. **Relationships and Social Connections**: Nurturing meaningful relationships with *family, friends, and community is vital for a fulfilling life.* Jobs can provide social interactions, but maintaining and growing these connections requires attention and effort beyond work hours.
- 6. **Contributing to Society**: Engaging in activities that contribute to the greater good and help others can provide a sense of *purpose and fulfillment that goes beyond a job*.

Ultimately, the answer to whether a job is enough for life varies from person to person. Some individuals find contentment in their work, while others seek a more holistic approach to fulfillment, combining various aspects of life to create a meaningful and satisfying existence. Striking a balance between professional commitments and personal aspirations is key to leading a fulfilling life.

Written By: Aman Kumar Mahto (2102423), Sem IV

# VIBRATIONAL ANALYSIS AND NOISE CONTROL

Vibration analysis and noise control are essential disciplines within the field of mechanical engineering that deal with understanding, monitoring, and mitigating vibrations and noise in mechanical systems and structures. Let's explore each of these topics:

#### Vibration Analysis:

Vibration analysis involves studying the oscillations and movements of mechanical systems and structures. Vibrations can occur naturally in machines, buildings, bridges, vehicles, and various other engineering systems. While some level of vibration is acceptable, excessive or uncontrolled vibrations can lead to several issues, including:

- 1. **Fatigue Failure**: Vibrations can cause repeated stress cycles, leading to fatigue failure in components and structures over time.
- 2. **Reduced Performance**: Excessive vibrations can negatively affect the performance and accuracy of machinery and equipment.
- 3. Noise Generation: Vibrations can often be associated with noise, which may be undesirable in certain applications.
- 4. **Comfort and Safety Concerns**: Vibrations can cause discomfort to users or occupants and may pose safety risks if not appropriately controlled.

Vibration analysis involves using various techniques such as measurement instruments, sensors, and computer simulations to analyze and *understand the characteristics of vibrations*. *Engineers can identify the root causes of vibrations, assess their severity, and design effective solutions to control or mitigate them*. Common techniques for vibration analysis include modal analysis, frequency response analysis, and time-domain analysis.



**Noise Control**:

Noise control is the process of reducing or eliminating unwanted sounds that can arise from various sources, such as machinery, engines, ventilation systems, and environmental factors. Uncontrolled noise can have adverse effects on *health, safety, and overall well-being*. Some of the negative impacts of excessive noise include:

- 1. **Hearing Damage**: Prolonged exposure to high noise levels can cause permanent hearing damage.
- 2. Sleep Disturbances: Noise pollution can disrupt sleep patterns, leading to sleep disturbances and related health issues.
- 3. **Communication Impairment**: High noise levels can hinder communication and affect productivity and safety in work environments.
- 4. Environmental Concerns: Noise pollution can impact wildlife and ecosystems, especially in natural habitats.



Netlonal Aeronautics and Space Administration John H. Glenn Research Center at Lewis Field

Noise control measures can involve various techniques, including:

- 1. **Isolation and Damping**: Using vibration isolators and damping materials to reduce the transmission of noise from one component to another.
- 2. Active Noise Control: Using electronic systems to produce sound waves that cancel out undesirable noise.
- 3. **Soundproofing**: Implementing sound-absorbing materials or enclosures to reduce noise propagation.
- 4. **Design Optimization**: Incorporating noise control considerations during the design phase to minimize noise generation.

Vibration analysis and noise control are essential aspects of engineering, ensuring the performance, safety, and comfort of mechanical systems in various applications. Engineers with expertise in these areas play *a crucial role in designing and maintaining efficient and sustainable systems* while creating a quieter and more pleasant environment for users and communities.

Written by: Anuraag Gilhotra (2102424), Sem IV

### <u>IS COLLEGE LIFE ONLY ABOUT</u> <u>STUDIES???</u>

No, college life is not only about studies. While academic pursuits are an essential part of college life, there are many other aspects that contribute to a well-rounded and enriching experience. College is a time for personal growth, exploration, and building memories that will last a lifetime. Here are some other important aspects of college life:

- 1. **Extracurricular Activities**: Colleges offer a wide range of extracurricular activities, including sports, clubs, societies, cultural events, and community service opportunities. Engaging in these activities allows students to pursue their interests, develop leadership skills, and build social connections.
- 2. Social Life and Friendships: College provides an opportunity to meet people from diverse backgrounds and form lasting friendships. Social interactions and connections with classmates and peers are an integral part of the college experience.
- 3. **Personal Development**: College is a time of personal growth and self-discovery. It allows students to explore their passions, develop critical thinking skills, and gain a deeper understanding of themselves and the world around them.
- 4. Networking and Career Development: College is an excellent time to start building a professional network. Participating in career fairs, internships, and networking events can open doors to future career opportunities.
- 5. **Independence and Responsibility**: College life often involves living away from home, which fosters independence and teaches valuable life skills, such as time management, budgeting, and decision-making.
- 6. **Exploring New Interests**: College offers the chance to explore new subjects and disciplines beyond the chosen major. Taking electives and attending lectures on various topics can broaden one's horizons.
- 7. **Cultural and Intellectual Exposure**: Colleges host various cultural events, seminars, and guest lectures by renowned speakers. These opportunities expose students to diverse perspectives and ideas.
- 8. Fitness and Wellness: Many colleges have fitness centers and wellness programs, promoting physical health and mental well-being among students.
- 9. Volunteer Work and Social Impact: College provides a platform for students to get involved in community service and make a positive impact on society.
- 10. **Travel and Adventure**: College life often includes opportunities for travel, whether through study abroad programs or organized trips, allowing students to experience new cultures and places.



Overall, college life is a multifaceted experience that goes beyond academic studies. It offers a unique time for personal, social, and intellectual growth, preparing students for future challenges and enriching their lives in various ways. Balancing academic pursuits with extracurricular activities and personal interests is key to making the most of the college experience.



Written by: Mayank (2102433), Sem IV

# ADDITIVE MANUFACTURING AND 3D PRINTING

Additive manufacturing, commonly known as 3D printing, is a revolutionary manufacturing process that creates three-dimensional objects by adding material layer by layer. Unlike traditional subtractive manufacturing, where material is removed from a solid block, additive manufacturing builds up the object from scratch. This technology has gained significant popularity and is transforming various industries.

Additive manufacturing builds objects layer by layer, based on a digital 3D model. This layerwise approach enables the creation of complex geometries that may be challenging or impossible to achieve using traditional methods. Additive manufacturing processes can work with a wide range of materials, including plastics, metals, ceramics, composites, and even biological materials. The choice of material depends on the application and desired properties of the final product. 3D printing allows for design freedom and customization, enabling engineers and designers to create unique and tailor-made products for specific needs and applications. Additive manufacturing is commonly used for rapid prototyping, allowing designers and engineers to quickly produce and test iterations of a design before committing to mass production.



Additive manufacturing is inherently more sustainable than traditional manufacturing methods because it only uses the material required to build the final product, minimizing waste. 3D printing enables the creation of complex structures, intricate details, and internal features that may be challenging or impossible to achieve using conventional techniques. Additive manufacturing has significant applications in the medical and healthcare industries, including custom prosthetics, patient-specific implants, and tissue engineering. Additive manufacturing is revolutionizing the aerospace and automotive sectors by enabling lightweight and high-performance components, leading to fuel efficiency and performance improvements.

3D printing is used for producing jigs, fixtures, and tooling for various manufacturing processes, making production more efficient and cost-effective. Additive manufacturing is valuable in educational settings and research laboratories for hands-on learning, rapid prototyping of research concepts, and material testing. With advancements in 3D printing technology, on-demand manufacturing and localized production are becoming more feasible, reducing supply chain complexities and lead times. Despite its many advantages, additive manufacturing faces challenges such as limited scalability for mass production, material quality control, and the need for skilled operators and designers.



Additive manufacturing and 3D printing are continuously evolving fields with the potential to disrupt traditional manufacturing processes and open up new possibilities for innovation across industries. As technology advances and materials continue to improve, 3D printing is expected to play an increasingly significant role in shaping the future of manufacturing and design.

Written by: Sehajpreet Singh(2102446), Sem IV

# **REDUCED WASTE**

#### Introduction:

In today's world, where environmental concerns are at the forefront, industries are increasingly seeking sustainable solutions to reduce waste and minimize their ecological footprint. One such revolutionary technology that holds the potential to significantly reduce waste in production processes is additive manufacturing, commonly known as 3D printing. By adopting this innovative approach, companies can embrace sustainability while reaping numerous other benefits.

#### The Traditional Manufacturing Dilemma:

Traditional manufacturing methods often involve subtractive processes, where raw materials are cut, drilled, or machined to produce the desired end product. This results in substantial material waste, especially in the form of offcuts and unused sections. Additionally, these processes often require complex tooling and extensive setup, leading to higher energy consumption and increased waste.

#### Additive Manufacturing: A Sustainable Paradigm Shift:

Additive manufacturing provides a paradigm shift in production methodologies by building objects layer by layer using computer-aided design (CAD) models. This process eliminates the need for cutting, machining, and tooling, significantly reducing waste generation and resource consumption.

- 1. **Material Efficiency:** Unlike traditional methods, where excess material is removed, additive manufacturing utilizes only the required material for building the object. This feature alone ensures drastic material savings, making it an environmentally responsible choice.
- 2. **Design Optimization:** The design freedom offered by 3D printing allows engineers to create intricate structures, optimizing parts for weight reduction without compromising strength. Lighter components result in lower material usage and reduced transportation-related emissions.
- 3. **On-Demand Manufacturing:** Additive manufacturing enables on-demand production, eliminating the need for large inventories. This just-in-time production approach further minimizes excess stock and the waste associated with obsolete or unsold products.
- 4. **Recycling Opportunities:** Many additive manufacturing materials are recyclable, allowing waste or failed prints to be reused, further minimizing the overall environmental impact.
- 5. Localized Production: The ability to print products at or near the point of use reduces transportation requirements, leading to a decreased carbon footprint.

Written by: Nikhil (2102438), Sem IV